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AN ANALYSIS OF TEXTURE, TIMBRE, AND RHYTHM IN RELATION TO FORM IN MAGNUS LINDBERG'S *GRAN DUO*

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By

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AN ANALYSIS OF TEXTURE, TIMBRE, AND RHYTHM
IN RELATION TO FORM IN MAGNUS LINDBERG'S *GRAN DUO*

A DOCUMENT APPROVED FOR THE
SCHOOL OF MUSIC

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ABSTRACT

Gran Duo (1999-2000) by Magnus Lindberg (b. 1958) is the result of a commission by Sir Simon Rattle, former conductor of the City of Birmingham (England) Symphony Orchestra, and the Royal Festival Hall to commemorate the third millennium. Composed for twenty-four woodwinds and brass, Lindberg divides the woodwind and brass families into eight characters that serve as participants in an attentive twenty-minute conversation.

The document includes biographical information about the composition to further understand Lindberg's writing style. The composer's use of computer-assisted composition techniques inspires an alternative structural analysis of *Gran Duo*. Spectral graphs provide a supplementary tool for score study assisting with the verification of formal structural elements. A tempo chart allows the conductor to easily identify form and tempo relationships between each of the nineteen sections throughout the five-movement composition.

In order to reveal character areas and their relation to the structure of the work, the analysis of texture, timbre, and rhythm reveal the formal structure of the composition, which reflects a conversation between the brass and woodwinds in this setting for wind instruments.

CHAPTER 1: INTRODUCTION

"It's the extremes that interest me, nothing in between."[1]

Finnish composer Magnus Lindberg (b. 1958) composed *Gran Duo* (1999-2000) for twenty-four wind instruments as the result of a commissioning project from England's City of Birmingham Symphony Orchestra, Sir Simon Rattle conductor. *Towards the Millennium* was a project designed by Rattle in 1991 to commission new works and perform select classical works from specific decades of the twentieth century. In addition to standard classical repertoire, each spring from the 1991 to 2000 seasons the orchestra commissioned works to be paired with previous commissions from selected decades of the twentieth century. The premiere performance of *Gran Duo* occurred on March 8, 2000 at the Royal Festival Hall in London by the City of Birmingham Symphony Orchestra, Sir Simon Rattle conducting.

When Rattle contacted Lindberg about a possible commission, the primary response from Lindberg was, "What I can't do is to do another commission for orchestra."

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[1] Magnus Lindberg, Joshua Cody, and Kirk Noreen, "Magnus Lindberg in Conversation. Moving Between Extremes," *The Musical Times* 141, no. 1872 (Autumn, 2000): 37.

Rattle's conversation with Lindberg is recollected during an interview with wind band conductor Tim Reynish:[2]

> Lindberg was almost the "man-of-the-moment" to write a standard twenty-minute extraordinary orchestra piece. Lindberg said, "Have you got any ideas?" and I [Rattle] said, "Well this is what we need" and interestingly he played around with all kinds of things. To start off with [Lindberg] thought he would use harps, piano, and percussion, do the usual thing, and he was also going to use a lot of horns, six to eight placed antiphonally around the hall. Then gradually he decided to set himself [up with] more and more problems. [Lindberg] thought no, this is all extraneous, and what would be really interesting to do now is something that takes the two halves of the wind orchestra and give them their own different personality and then see how it meshes without any outside help or interference. Obviously taking Stravinsky as his mentor, but also using the type of [harmonic] discipline of Sibelius. Lindberg also was wanting to do something which was not musically outlandish but which would take the instruments to their furthest possible extreme.[3]

Lindberg's wish to write for winds reflects an experiment in orchestral programming that prevailed during the first decade of the twenty-first century.[4] Leonard Slatkin, after a concert with the U.S. Marine Band at the Kennedy Center

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[2] Tim Reynish interviews Simon Rattle after a CBSO rehearsal following the premiere of *Gran Duo* on March 8, 2000. Reynish, former horn player in the CBSO, reflects on Rattle's conversation with Lindberg during the commissioning stage of *Gran Duo.*

[3] Tim Reynish Interviews Conducting, "An Interview with Sir Simon Rattle," Tim Reynish, *http://www.timreynish.com/conducting/interviews/* (accessed May 6, 2012).

[4] Frank Battisti, *The Winds of Change* II (Galesville, MD: Meredith Music Publications, 2012), 47.

in Washington, D.C., comments on the rise of wind works on orchestral concerts:

> I think you are finding … more composers… using the orchestral venue to experiment and use different frameworks. So, some of the works that are emerging for wind ensemble are designed not only for use with bands but for use within an orchestral concert where you might not require the strings.[5]

The instrumentation for *Gran Duo* echoes Slatkin's quote and documents a growing flexibility in orchestral programming to include works for the wind ensemble. Examples of wind works presented on orchestral programs include John Corigliano's *Circus Maximus* (2004), programmed by Slatkin, and Joseph Turrin's *Hemispheres*, for Winds and Percussion (2002). Kurt Masur upon his retirement as conductor from the New York Philharmonic commissioned Turrin to write a wind and percussion work for his final concert. Although the absence of percussion is unique for the wind band, the instrumentation choice aligns with Lindberg's quote that "It's the extremes that interest me." Lindberg's spectral composition process offers the band a new direction in musical exploration.

Lindberg's choice of instrumentation closely resembles the size and color of Stravinsky's revised *Symphonies of Wind Instruments* (1947). It is not

[5] Timothy Reynish, "Message from the President," WASBE Newsletter (December 2000).

surprising to discover that Lindberg referenced Stravinsky's instrumentation due to his fascination with Stravinsky's music. *Gran Duo* is written for twenty-four instruments: three flutes (third doubling piccolo), two oboes, cor anglais, three B-flat clarinets, bass clarinet, two bassoons, double bassoon, four horns in F, three trumpets in C (third trumpet doubling on trumpet in D), three trombones, and tuba. *Gran Duo* varies from the standard American wind band instrumentation by excluding saxophone and euphonium. This instrumentation choice is not uncommon, as a number of wind band compositions do not include the saxophone and euphonium such as works by William Bolcom and Joaquín Rodrigo.

One indicator of a composition's success is the number of performances it receives following its premiere. According to Boosey and Hawkes, distributor and publisher of *Gran Duo*, ninety-seven performances between March 8, 2000 and November 26, 2012 have occurred.[6] Of these ninety-seven performances, eighty-two performances by orchestral wind sections, four by military ensembles, five by professional wind bands, and six by university wind bands (three American and three European institutions). Only two

[6] Boosey and Hawkes, "Performance Search: Gran Duo." Boosey and Hawkes, http://www.boosey.com/pages/cr/calendar/perf_results.asp (accessed May 20, 2013).

wind band recordings of *Gran Duo* have been produced by American universities: the University of Kentucky Wind Ensemble (2004), Timothy Reynish conductor, and the New England Conservatory (2005), Charles Peltz conductor. The New England Conservatory recording coincided with a performance of *Gran Duo* at the 2005 College Band Directors' National Association Conference at Carnegie Hall in New York City.

Lindberg's compositional technique sets him apart from traditional composition methods. Techniques found in *Gran Duo* reflect his use of a computer program for computer-assisted composition (CAC). A modified harmonic or overtone series prepared by a computer generates *spectral harmonies*, a type of harmony based on acoustic phenomena, similar to the overtone series.[7] The computer houses a database of chords constructed from algorithms using the overtone series. Lindberg later chooses chords from the database depending on what type of harmonic progression he wishes to utilize. The process is linked to set theory, allowing Lindberg to have total control over the intervallic content of the chord progressions. Lindberg also reuses harmonic material from his own and

[7] Anders Beyer, "A New World of Sound." in *The Voice of Music: Conversations With Composers of Our Time*, by Anders Beyer (Burlington, VT: Ashgate Publishing Company, 2000), 281.

other composers' works in each composition. He jokes in an interview about the recycling process he uses for composing harmonies, "I am a sherry maker. I constantly collect material and build on things I have been doing before."[8]

The development of Lindberg's compositional style took on its identity at the *Institut de Recherche et Coordination Acoustique/Musique* (IRCAM) in Paris between 1981 and 1993. These twelve years allowed Lindberg to explore a variety of genres and influences that he assimilated and integrated in a very personal way, which allowed him to keep the post-modern aesthetic at a distance. Lindberg's musical influences found inspirations from free jazz, the energy of post-punk rock, American minimalism, traditional music—particularly of Southeast Asia (gamelan) and Jean Sibelius's use of texture and harmony. Lindberg also studied the practice of Babbitt's serialism and the principals of harmonic classification of set harmonic theory credited to Allen Forte.[9] The influence of French spectral music, developed at IRCAM, is

[8] New York Philharmonic, "Offstage with Magnus Lindberg: Commissions and Composing," NewYorkPhilharmonic YouTube Channel, 4:27, http://www.youtube.com/watch?v=drIQwS60T-0&feature=relmfu (accessed September 16, 2012).

[9] IRCAM "Magnus Lindberg" Biography, trans. Jessica Clark, http://brahms.ircam.fr/magnus-lindberg (accessed September 16, 2012).

attributed to the formation of Lindberg's unique harmonic compositional style first used in *Kinetics* (1988-1989), *Marea* (1989-1990), *Joy* (1989-1990), and later in *Gran Duo.*

Gran Duo is a post-serial work labeled by theorist Marcus Castrén as a neo-tonal and spectral composition.[10] Spectral music for the purpose of this document will be defined as works in which compositional decisions are aided by the analysis of computer-based programs. These computer-aided decisions use sound spectra to provide rhythmic and harmonic decisions used in the structural design of the composition. Spectral music "is a music based on the sound itself… namely an instrumental synthesis of various sound models."[11] Meaning that instead of using sound only as an aesthetic, the computer program allows the composer to enter specific parameters for manipulating timbre as an element of compositional structure.[12] Given the intricacies of the computer-assisted compositional process, one could question the artistic significance of a work created in collaboration with such a complicated computer program. Lindberg defends this,

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[10] Marcus Castrén, "Aspects of Pitch Organisation in Magnus Lindberg's *Gran Duo* for 24 Wind Instruments." *A Composition As A Problem* IV, no. 1 (2004): 61.

[11] Justin Lepany, "Principles and Techniques of Spectral Music" (thesis, Cardiff University, 2005), 3-4.

[12] Ian Whalley, "Spectral World Musics: Proceedings of the Istanbul Spectral Music Conference (review)" *Computer Music Journal* 34, no. 2 (Summer 2010): 94.

however, stating that "insight to this kind of special knowledge [spectral music] will allow us to get more out of music… to make more interesting music."[13] Lindberg chooses to utilize a compositional outlet with greater pitch options due to his work with the harmonic series.

NEED FOR THE STUDY

Lindberg's high productivity in the orchestral medium for a composer of his age (b. 1958) provides him international notoriety, but this notoriety has yet to extend to the wind band community. Lindberg's only works for wind band to date, *Gran Duo* and *Zungenstimmen* (1994), are still unfamiliar to most wind band conductors, and sessions on his music have yet to be presented at conferences. Lindberg's computer-assisted composition techniques and the absence of "spectral music" wind band compositions could be reasons for the lack of familiarity of this composer in the band community. The high technical and endurance demands required of the ensemble may limit performances of *Gran Duo*. However, such demands have not been a deterring factor for programming other pieces of literature in the wind band repertoire such as Jon

[13] Beyer, 289.

Corigliano's *Circus Maximus* (2004) and Joseph Schwantner's *…and the mountains rising nowhere* (1977).

Due to Lindberg's international success and the limited information published about *Gran Duo,* there is a need to examine the composer and his innovative work for winds. To date, a website, either private or through Lindberg's publisher, does not exist where one can find a complete catalogue of his music or detailed biographical information. Understanding Lindberg's computer-assisted compositional processes may help conductors understand the textural, timbral, and rhythmic impact of the computer-assisted process as related to form in *Gran Duo*. In addition to creating awareness about Lindberg and his *Gran Duo*, the document will contribute to the study of literature of the twenty-first century wind band.

PURPOSE

The purpose of this document is to assist the conductor in performance of Magnus Lindberg's *Gran Duo* for twenty-four winds by examining the relationships of texture, timbre, and rhythm to form. The document includes pertinent biographical information to further aid in a conductor's understanding of the composer's stylistic influences. Due to the twenty-minute length and complexity

of the piece, the document particularly assists conductors in understanding tension and release, phrasing, and architectural shape of *Gran Duo*.

LIMITATIONS OF THE STUDY

Magnus Lindberg, a contemporary Finnish composer, is largely unfamiliar to the contemporary American wind band community. Because Lindberg, a pianist, is regarded as an orchestral composer, many of his works have been commissioned by orchestra boards or by conductors who have knowledge of Lindberg's compositional style. Rather than present information on Lindberg's views of writing for the wind band, the primary focus of this document is to inform the wind band community of the composer's background.

While texture, timbre, and rhythm are fundamentals examined in the work, dynamic contrast will not be addressed due to its primary function as a result of textural change. The document will not analyze pitch organization and harmony due to an existing published study by Marcus Castrén, professor of theory at the Sibelius Academy in Helsinki, Finland. Instead, Castrén's study will provide the framework from which the analysis of texture, timbre, and rhythm will be used to realize the compositional architecture of *Gran Duo*.

RELATED LITERATURE

Four dissertations address compositions by Magnus Lindberg. In addition to dissertations, Marcus Castrén's published analysis on pitch organization of *Gran Duo* exists. Castrén's analysis provides information about three elements in Lindberg's process of pitch organization for *Grand Duo*.[14] The first element Castrén describes is Lindberg's creation of "wide scales" as an ordering for all twelve pitch-classes of the chromatic scale. Castrén's second element examines hexads found in each of the wide scales. The third area explains Lindberg's use of the overtone series to create a "twelve-pitch modified harmonic series containing exactly one representative of each pitch-class."[15] Castrén extracts several areas of the composition to clarify the composer's "wide scales" application.

Edward Martin's 2005 dissertation, *Harmonic Progression in the Music of Magnus Lindberg*, describes the composer's "consistent and methodical harmonic system through the treatment of harmony and harmonic progression

[14] Marcus Castrén, "Aspects of Pitch Organisation in Magnus Lindberg's *Gran Duo* for 24 Wind Instruments," ed. Mart Humal, *A Composition As A Problem* IV, no. 1 (2004): 61-74.

[15] Ibid, 62.

since 1986."[16] Martin's document is critical to understanding Lindberg's process in composing a chaconne, which is used as a harmonic foundation for the majority of his works including *Gran Duo*.

Christopher Gainey's 2009 dissertation, *Turning Sound Into Music: Attitudes of Spectralism,*[17] is important for understanding how Lindberg and other spectral composers apply spectral techniques to music. The document does not address *Gran Duo*, but includes information about Lindberg's compositional processes and methods.

Rhonda Taylor's 2005 dissertation, *Gérard Grisey's "Anubis Et Nout": A Historical and Analytical Perspective*,[18] uses graphs to analyze texture, timbre, and rhythm. Although Taylor's document does not provide information about *Gran Duo,* the graphs and historical context of Grisey, co-founder with Tristan Murail of the spectral music genre, provide valuable information about the history and analysis of spectral music.

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[16] Edward Martin, "Harmonic Progression in the Music of Magnus Lindberg" (DMA diss., University of Illinois, 2005), 100.

[17] Christopher Gainey, "Turning Sound Into Music: Attitudes of Spectralism" (PhD diss., University of Iowa, 2009), 133.

[18] Rhonda Taylor, "Gérard Grisey's "Anubis Et Nout": A Historical and Analytical Perspective" (DMA diss., University of Arizona, 2005), 104.

Kari Besharse's 2009 dissertation, *The Role of Texture in French Spectral Music,*[19] provides insight into the techniques used for discovering textural development in a spectral music composition. Graphs in the study provide analytical information about a spectral composer's use of timbre, texture, and time as compositional techniques.

Due to Lindberg's status as a contemporary composer, interviews and recordings of his music have not been compiled at a central source. Findings in *The Music Index, JSTOR, Oxford Music Online, Grove Music Encyclopedia, ProQuest* and *WorldCat* provide the greatest depth of information on Lindberg's compositional process and biographical information to date.

PROCEDURES AND ORGANIZATION

The analytical approach used in this document provides conductors and performers with a view of the compositional practices of Magnus Lindberg's *Gran Duo*. Spectral graphs are used to reveal a visual perspective of *Gran Duo*. Chapter 1 unveils the context from which the work originated and information leading to the

[19] Kari Besharse, "The Role of Texture in French Spectral Music" (DMA diss., University of Illinois at Urbana-Champaign, 2009), 234.

commissioning and composing of *Gran Duo*. Chapter 2 reveals aspects from Marcus Castrén's 2004 published analysis of pitch organization to provide a framework for examining texture, timbre, and rhythm in *Gran Duo*. Chapter 3 constructs and utilizes graphs for a spectral analysis of the texture of the piece, which provides insight into how the elements of melody, harmony, and rhythm work together to create the contrasting roles of woodwinds and brass in *Gran Duo*. Chapter 4 provides a view of rhythm and timbral aspects found in *Gran Duo*. Chapter 5 provides more detailed information about each of the character areas and their importance in defining the form in the composition. Chapter 6 summarizes, provides conclusions, and lists suggestions for further research on *Gran Duo*. The appendices present program notes, a tempo graph, and spectral graphs of the complete work.

CHAPTER 2: FORM

Information from Marcus Castrén's 2004 published analysis of pitch organization and manuscript materials from the composer provides a formal framework for *Gran Duo.* Castrén's research and Lindberg's manuscript serve as a point of departure in understanding how the relationships of texture, timbre, and rhythm contribute to the formal design of the work.

The work is organized into five movements. Because movements and sections are not labeled in the published score, measure numbers are used in this document to assist the conductor with their location. The five movements I, II, III, IV, and V are further divided into nineteen sections, as illustrated in Example 2.1.

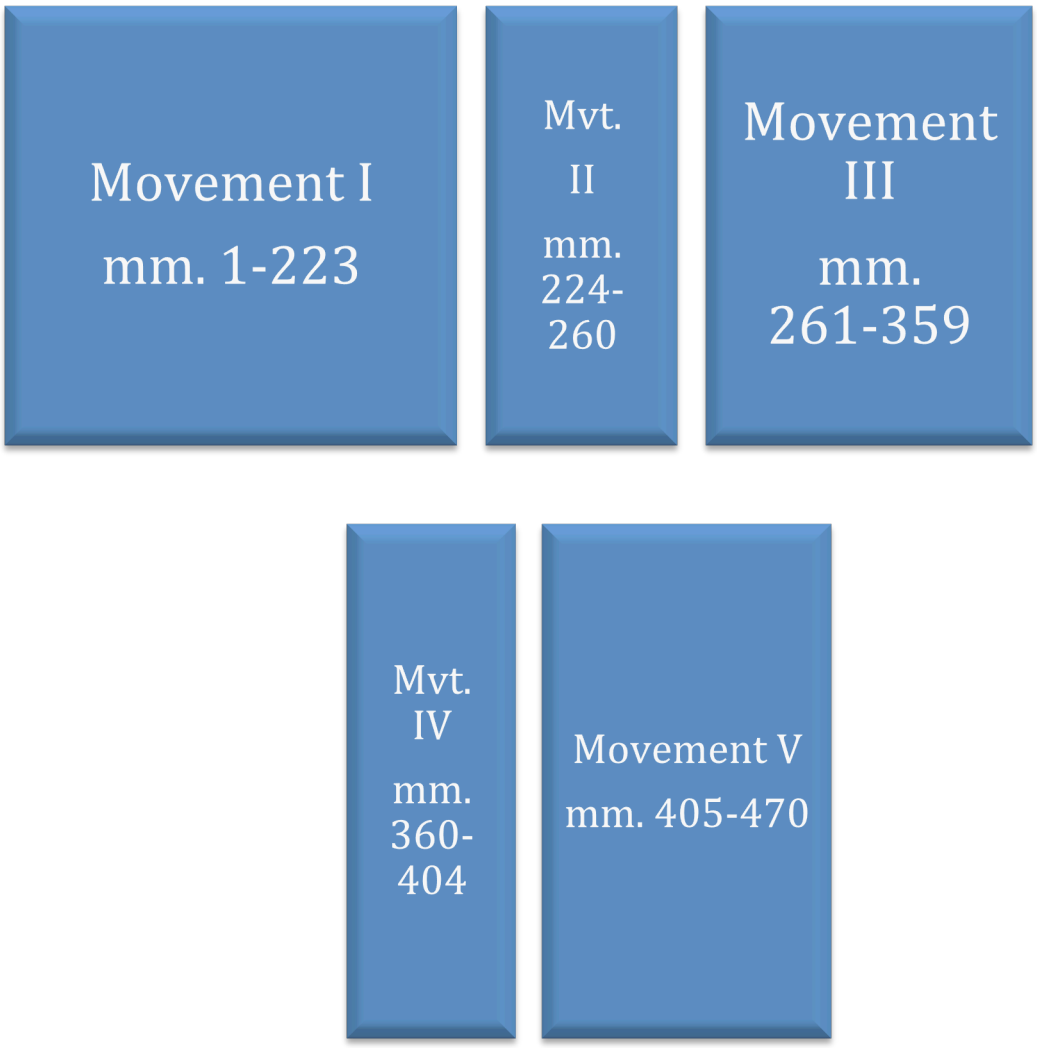
Example 2.1: *Gran Duo*. Section organization of the five movements with Lindberg's section labels.

Movement	Section						
I	I. Intro mm. 1-53	II. Expo mm. 54-96	III. Expo mm. 97-113	IV. Low Ascending mm. 114-144	V. High Descending mm. 145-171	VI. Voices mm. 172-196	VII. Corrente mm. 197-223
II	VIII. Transition mm. 224-232	IX. Slow-Field mm. 233-239	X. Slow-Lamento mm. 240-260				
III	XI. Coro mm. 261-285	XII. Scherzo mm. 286-314	XIII. Urt mm. 315-343	XIV. Climax mm. 344-359			
IV	XV. Solo mm. 360-373	XVI. Duo-Cadenza mm. 374-404					
V	XVII. Recapitulazione mm. 405-418	XVIII. Raga mm. 419-434	XIX. Chorale mm. 435-470				

In the manuscript of *Gran Duo* the composer provides titles for the sections within each movement as included in Example 2.1. Lindberg chooses descriptive labels such as Intro, Expo, Transition, etc. to indicate the formal descriptions of the composition's nineteen sections. Some sections in *Gran Duo* such as Corrente, Urt, and Chorale are named after earlier compositions or sketches that Lindberg borrowed and reutilized in *Gran Duo*, either in their entirety or for rhythmic or harmonic elements only. Movement I, as labeled by the composer listed in Example 2.1, contains seven sections, Movement II contains three sections, Movement III contains four sections, Movement IV contains two sections, and Movement V contains three sections.[20] To place perspective on the length of each movement based on the number of measures per section, Example 2.2 represents a proportional overview of the five movements. The visual representation in Example 2.2 also assists conductors in visualizing the nineteen sections and five movements in the score.

[20] Marcus Castrén, "Aspects of Pitch Organisation in Magnus Lindberg's *Gran Duo* for 24 Wind Instruments." *A Composition As A Problem* IV, no. 1 (2004): 61.

Example 2.2: *Gran Duo*. A proportional representation of the five movements listed by measure.



In each of the five movements Lindberg creates sections he describes as *character areas*. Each of the eight character areas contains unique harmonic and tempo traits. These traits help the conductor identify each character, which leads to an understanding of the work's form. It is important to remember that the harmonic

progression corresponding to a specific character area is called a "chaconne." However, Lindberg's chaconne differs from the definition of a Baroque chaconne: a short repeated harmonic progression used to create variation and melodic invention.[21] Rather than analyzing *Gran Duo's* harmonic progression, it is important to understand Lindberg's unique use of the chaconne to uncover character areas. Edward Martin's dissertation reveals the harmonic progressions used in other compositions by Lindberg and explains the dual properties of the chaconne:

> The first is the dual nature of the harmonies that make up the main progression… A symmetrical 12-tone chord and a particular fundamental pitch are associated with each position of the main harmonic progression and its subsequent repetitions. Each repetition may include only the 12-tone component, only the overtone component, or a combination of both. The second aspect is that each instance of the main progression that includes an overtone component is "filtered" in a slightly different manner. That is, two overtone chords residing in two different progressions, while both generated from the same fundamental, may represent different partials of that fundamental. These two factors result in a situation in which very few progressions of the chaconne contain the same physically sounding chords. While the underlying structure of the chaconne is consistent throughout much of the work, its realization on the surface level is rather varied from progression to progression. Even in its simplest

[21] Alexander Silbiger, "Chaconne," *The New Grove Dictionary of Music and Musicians* (London: Macmillan, 2001).

> form, Lindberg's chaconne is strikingly more complex than its Baroque predecessor.[22]

Lindberg uses the harmonic series to create a *wide scale,* so named because of its vertical span stretching greater than an octave. Wide scales allow Lindberg flexibility in tonal centers that are used throughout his compositions. In *Gran Duo* the harmonic fundamental in each of the eight character areas serves as the foundation for each chaconne. The repetition found in a traditional chaconne is not present in Lindberg's chaconne due to the constant kaleidoscopic change in harmony. Given the nature of the harmonic series, a higher number of common tones exist between each of the wide scales as seen in Example 2.5. Selected pitches from the 12-tones overlap between harmonic areas, which explains the level of familiarity one hears with Lindberg's music after listening to his melodic and harmonic language. Identifying and understanding Lindberg's chaconne assists the conductor with labeling the eight character areas needed to discover the structural form of *Gran Duo.*

Lindberg begins each composition by designing the harmonic plan. This first step is a departure point for the formal structure and harmonic material for each of the

[22] Edward Martin, "Harmonic Progression in the Music of Magnus Lindberg" (DMA diss., University of Illinois, 2005), 40-41.

character areas in *Gran Duo.* The eight harmonic areas of the chaconne, labeled in Example 2.3, provide visual representation of the organization for *Gran Duo's* harmonic ordering.[23]

Example 2.3: *Gran Duo.* The chaconne, naming of the eight areas in order; Tr I = Transition I; Tr II = Transition II.

A	B	C	Tr I	Tr II	D	E	F

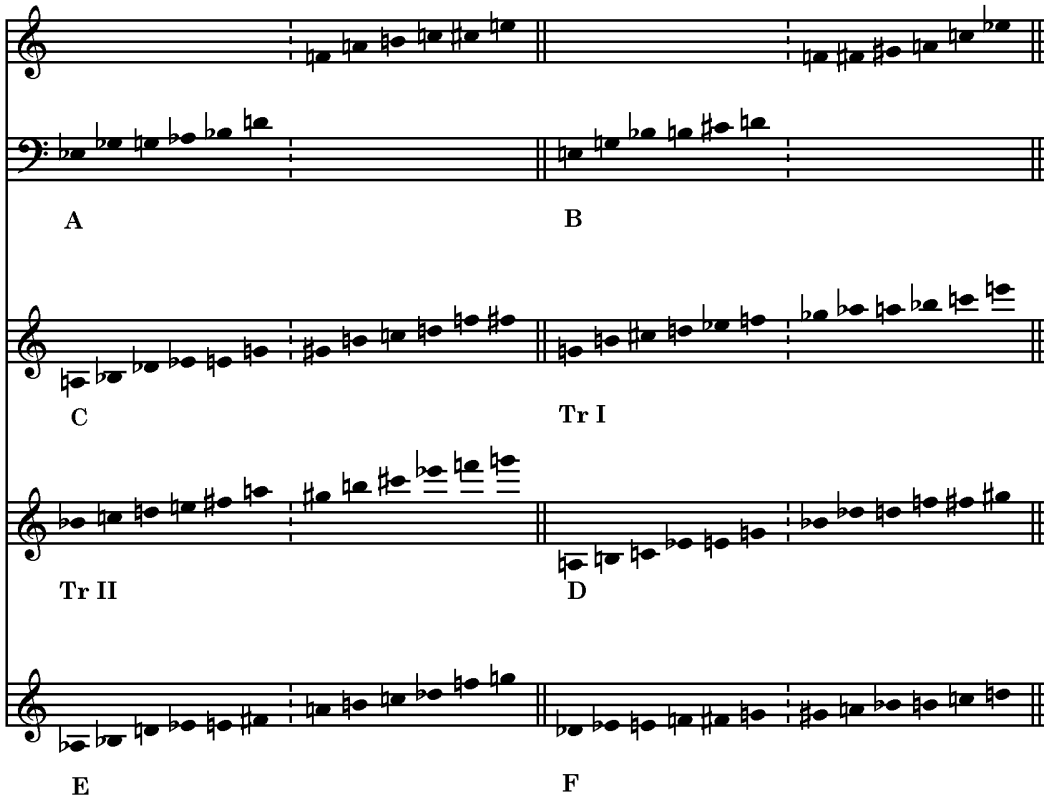
The fundamental for each of the harmonic areas Lindberg creates is listed in its order of appearance in Example 2.4. Castrén further describes wide scales as a specified ordering of all twelve pitch classes from the chromatic scale.[24] Each wide scale displayed in Example 2.5 represents corresponding material used in the chaconne area.[25]

[23] Castrén, 61.
[24] Ibid, 62.
[25] Ibid, 63.

Example 2.4: *Gran Duo*. The eight chaconne areas and their harmonic association in order of appearance in the chaconne.

Chaconne Area	A	B	C	Tr I	Tr II	D	E	F
Harmonic Area	E-flat	E	A	G	B-flat	A	A-flat	D-flat

Example 2.5: *Gran Duo.* The wide scales associated with each chaconne/character area.



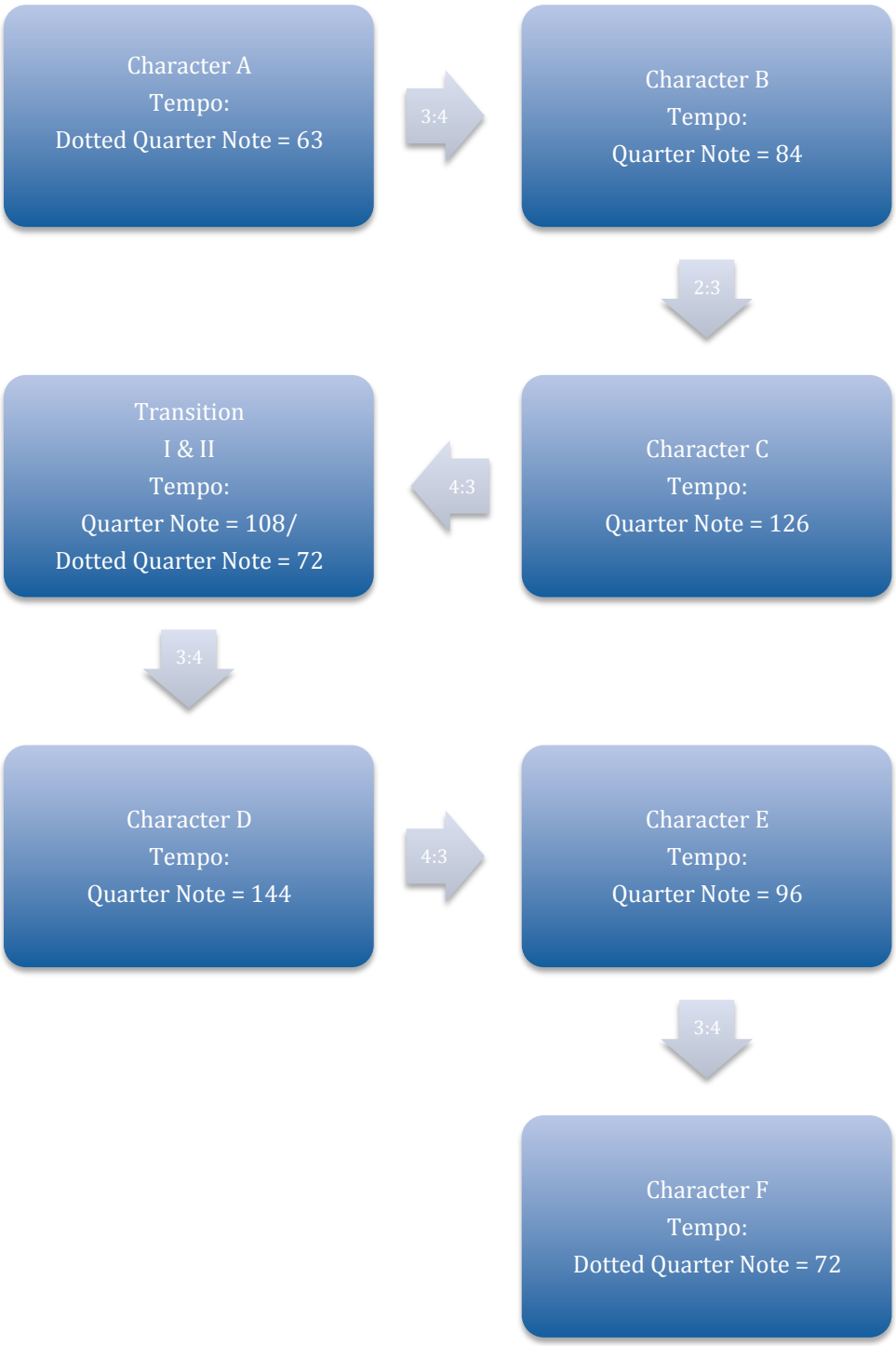
To further clarify this process the pitches in Example 2.5 are created using the overtone series and modified, as Castrén describes, to avoid duplication of the fundamental. The second, fourth, eighth, and sixteenth partials are omitted due to their octave duplication of the first partial. By eliminating these partials the final wide scale becomes a twelve-pitch modified harmonic series containing only one representative for each pitch-class.[26] It becomes significant during score study to realize the

[26] Ibid., 62.

harmonic process because the chaconne, serving as the harmonic foundation, is a defining trait for each character area. A conductor begins to realize the associations between each of the character areas after discovering that the analysis of structural form in *Gran Duo* relies on an examination of tempo, rhythm, and harmony as character elements. When characters reappear in variation each character can then be identified by various linking traits, which are found in the tempo and harmonic elements of each character area.

As a conductor it is important to identify how Lindberg uses various character areas in *Gran Duo* to create tension and release through harmonic and tempo elements. Because each character area is labeled with a specific tempo the graphing of tempo changes show visible patterns that identify structural elements in *Gran Duo*. The changes in tempi also assist the conductor with identifying the composition's character areas. The proportional relationships between character area tempos provide a metric and tempo modulation to assist with the transition between characters. Example 2.6 lists the proportional tempo relationships between each of the characters.

Example 2.6: *Gran Duo*. Tempo relationships illustrate the proportion between each of the characters. Character F is followed by a return to Character A.



In summary, the structural design viewed through the elements of texture, timbre, and rhythm reveals a proportionate tempo relationship between each of the eight characters. Characters in the five-movement work form patterns to reveal that the structural design actually imitates a conversation between brass and woodwinds in *Gran Duo*.

CHAPTER 3: TEXTURE

Chapter 2 established that tempo patterns provide information about the composition's structural design. Chapter 3 will analyze texture as an element to gain an understanding of tension and release in relationship to the composition's structural design. To better identify this influence, a visual representation of the texture was constructed with the computer program *Acousmographe 3.6.*[27] Texture influenced by tension and release can be difficult to analyze due to the orchestrated layering of different lines. Five character areas were selected in the score for spectral graph analysis due to their varying amounts of textural activity. Each spectral graph provides a visual representation of the varying amounts of tension and release.

The program *Acousmograph 3.6* is intended for use with electroacoustic music. *Acousmograph 3.6* was developed for composers and musicologists to analyze spectral music and display graphics and text annotations to a synchronized recording.[28] The composer provided this author with a MIDI version of *Gran Duo* to analyze with *Acousmograph 3.6.* A

[27] Acousmographe 2003-2010. Freeware: Release 3.6. Paris, France: Groupe de Recherches Musicales. http://www.inagrm.com/accueil/outils/acousmographe

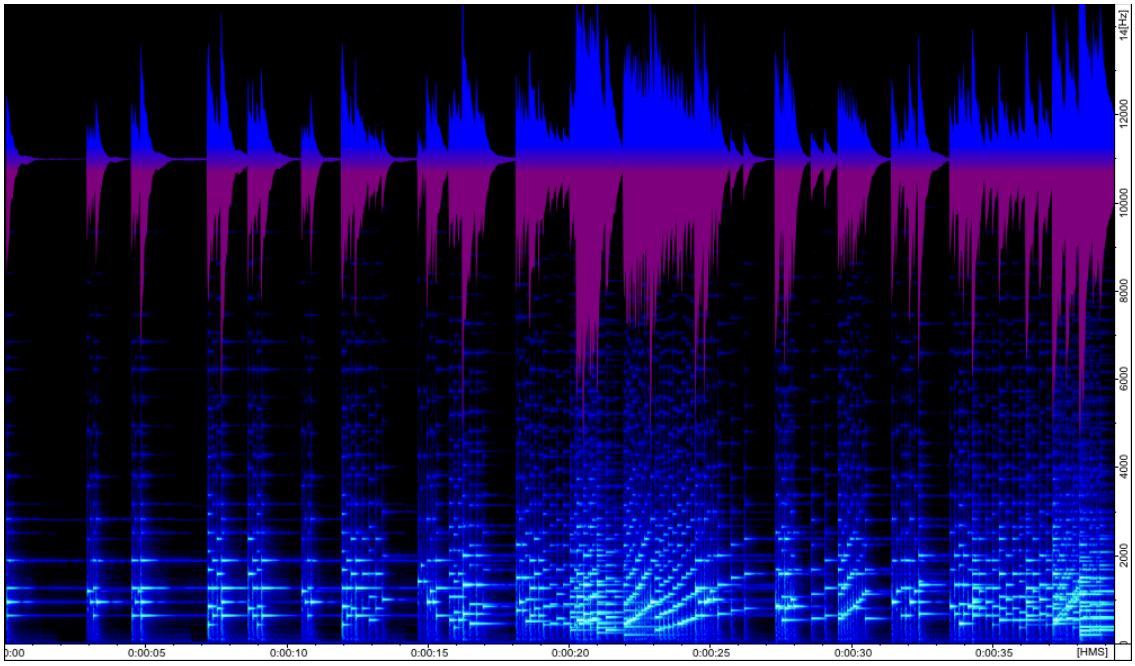
[28] Ibid.

MIDI version closely and consistently represents the composer's intended dynamic contrasts and articulations, thus eliminating the variables found between conductors and performers in a live recording. An additional feature of the MIDI generated tempo is that it accurately represents the composer's intent to proportionally control tempo in each of the character sections throughout the five movements. Similarly, dynamic contrast precisely matches the composer's intent and is not subject to human error or subjectivity. Ultimately, the spectral analysis provides a static environment to accurately view the structural design as controlled by the composer's Finale MIDI file.

To read the graphs one must note that the x-axis represents clock time of the MIDI file and the y-axis represents hertz levels (high and low frequency), which captures information between 0 Hz and 11,000 Hz. As a reference, the human ear is able to detect information between 20 Hz and 16,000 Hz, meaning that any data collected below 20 Hz will not be addressed. Density of texture is viewed on the spectrogram as dark and light shades of blue, representing points of change in the texture. Light blue represents a more dense texture and a darker blue represents the thinning of texture. The

brightest points on the graph represent both a point of articulation and the pitch of the harmonic fundamental. The overtones of the fundamental pitch are represented by varying shades of a darker blue measured in hertz along the y-axis. The overlay of a sound wave graph, above the spectrogram, assists with viewing the changes of texture represented by two channels: purple (right channel) and blue (left channel).

Example 3.1: *Gran Duo*. Representation of the Acousmographe viewed with spectrogram at bottom and wave graph on top to emphasize texture.

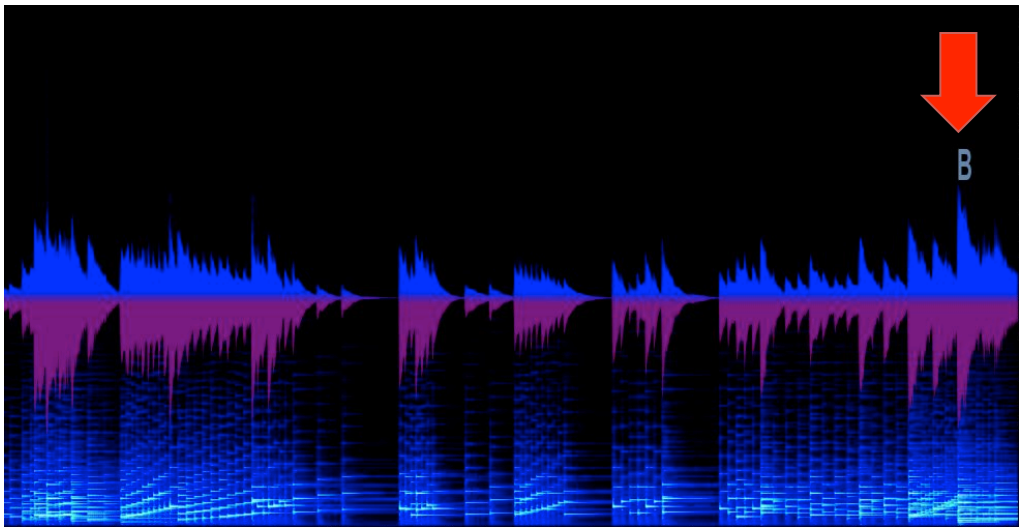


The linear sound wave, added above the spectrogram, provides a second layer of visual evidence of the tension and release points implied by textural changes. The wave

graph represents duration (x-axis: time) and amplitude (y-axis: hertz). Visible spikes on the sound wave graph represent new textural events over time. The dimensions of the spike correlate to the amplitude or volume of the sound.[29] In the analysis of these two elements a connection exists between texture and the structural form in *Gran Duo*.

The first example is an area marked with an arrow in Example 3.2 representing m. 21, Movement I Section I, which emphasizes a change in texture due to the brass entrance. The brass entrance is in contrast melodically and harmonically to the opening woodwind statement.

Example 3.2: *Gran Duo*, m. 21. Character B: entrance of the brass. Arrow indicates tempo change of quarter note = 84.



[29] Amplitude is defined as "intensity of sound" for the purpose of analyzing the changes of texture in *Gran Duo*.

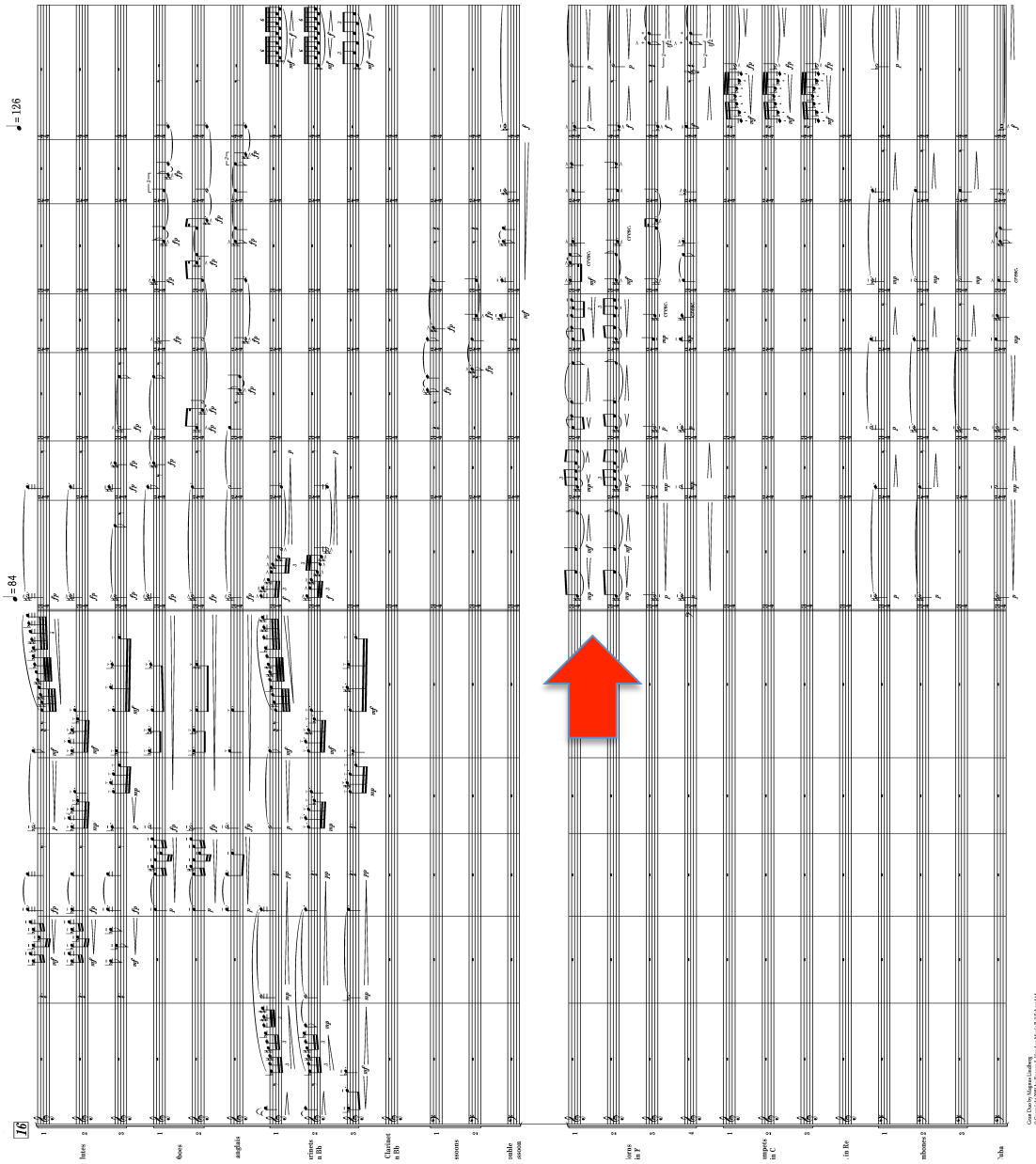
The arrow marking the entrance of the brass in Example 3.3 reflects the change in spectral activity on the graph in Example 3.2. A light blue marking of spectral activity at the bottom of the graph becomes more dense and bright in color at the brass entrance illustrating a drastic textural change.

The arrow in Example 3.3 also directs attention to the melodic contour of half steps in the horn theme. After comparing the brass statement at m. 21 to the opening statement of the woodwinds at m. 1, a solo and tutti texture is discovered. Additionally, the appearance of the woodwind melodic contour is disjunct with leaping intervals of fifths and thirds unlike the smooth chromatic horn melody.

In the score the entrance of the brass signifies the first appearance of Character B. A spike in sound waves at m. 21, due to the increase of decibels, corresponds to the arrival of a new character area. It is remarkable to discover the change in pulse and tempo of this character area reflects a spike in decibels and creates an increase of spectral activity. These fluctuations in spectral activity represent how changes in decibels, texture, and tempo reflect transformations of the formal design in the composition.

Referring to Example 3.3, the brass statement is marked at a dynamic below the woodwinds. Because the brass provide melodic and harmonic support in Character B it is important to adjust the brass timbre so that it continues to clearly represent the new color for the character and is not lost in the woodwind texture.

Example 3.3: *Grand Duo*, mm. 16-27. The relationship between dynamic contrast and texture at m. 21 the entrance of the brass.



As stated previously, character areas are defined by specific tempi and viewed on the spectral graph as a spike in decibels. Example 3.2 displays the tempo change

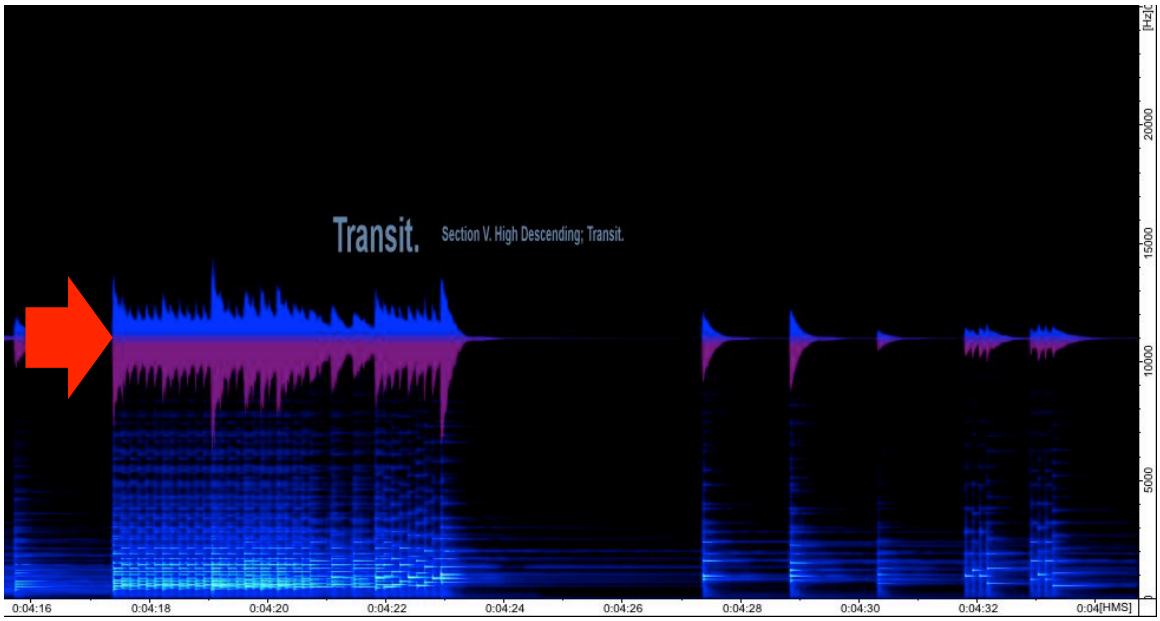
corresponding to the change of texture. One could argue that the entrance of the brass timbre reflects a change in the decibel level due to the directional nature of brass instruments. However, the data used during the production of the spectral graph was taken from a MIDI recording, which provides a consistent dynamic level as indicated by the composer's markings in the score. Therefore, the spike in activity reflects a change of tempo.

A second example illustrates recurring rhythmic ideas as an opportunity for Lindberg to create texture changes. An example is found in the sixteenth notes at m. 143, Example 3.3. The rhythmic pattern utilizes elements of timbre and pitch to create a transition into Section V. The arrow in Example 3.4 points to a series of sudden spikes in sound waves, the exact area where Lindberg begins the transition. The bottom of the graph indicates an increase in spectral activity due to the entrance of the oboes and cor anglais followed by the addition of the clarinets. Again, the change in texture as indicated on the graph relates to the transition.

In m. 144 a five-note motive, found in the trumpets and oboes on beat four of the measure, leads to a return of rhythmic and melodic material from Character A. The return of Character A's rhythm, tempo, and pitch require

the conductor to make decisions about ensemble balance and style of articulation. Because the return of character material is organic—meaning rhythmic and melodic changes occur—modifications can be made to the character material's articulations. These modifications to articulation reflect the way a change in dialogue occurs during a conversation. As each character returns the conductor determines through articulation and balance the amount of tension needed to convey the transformation in dialogue. Lindberg's changes in orchestration and articulation also suggest the texture imitates the growth of the conversation between the woodwinds and brass.

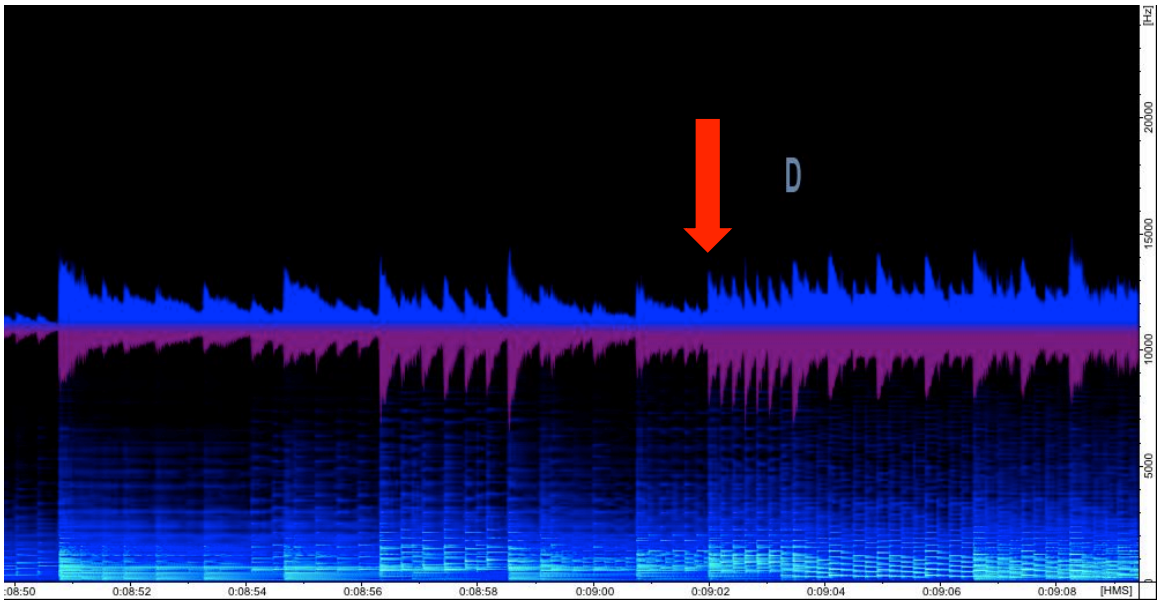
Example 3.4: *Gran Duo*, m. 143. Arrow indicates beginning of transition into Section V.



The “Transit.” marking used in Example 3.4 identifies the tempo change at m. 144. In his sketches Lindberg notes that this tempo change is the one-measure transition leading into Section V. For the conductor the location of this transition is important because of the sudden tempi changes, cutting the tempo in half: m. 144 quarter note = 108 for the transition and m. 145 quarter note = 54 immediately following the transition. A change in texture is confirmed by an increase of spectral activity. The concentration of articulated notes in the clarinets, oboes, and trumpets during the transition reflects the influx of spectral activity. The whiplash effect of the transition quickly redirects the conversation to prepare a return to Character A at m. 145. Following the one-measure transition Lindberg reduces the tempo indicated again as a spike in decibels on the spectral graph at 0:04:22.

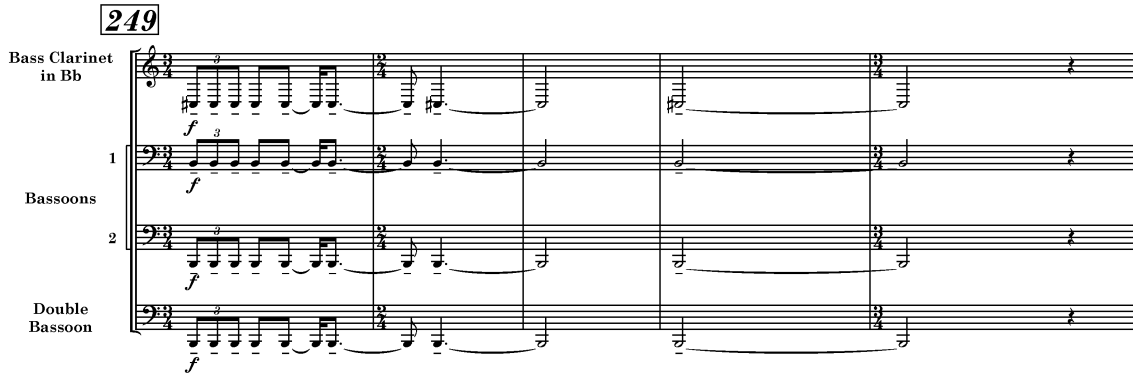
The next three graphs serve as visual aides for the conductor explaining the transitional area leading to Movement III. As the energy and tension become intensified by orchestration and rhythm choices the addition of instruments increases the musical energy. This increase of energy mimics an irritated conversation between the brass and woodwind characters.

Example 3.5: *Gran Duo*, mm. 249-257. Section D, half note = 72. Change in rhythmic intensity indicated at arrow, mm. 252-253.



Example 3.5 displays mm. 249 to 257, which reveals the spectral image of a transitional area leading to Character D. In Character D the tempo accelerates from quarter note = 54 to half note = 72. In examining the rhythmic organization the conductor notices that Lindberg gradually increases rhythmic duration during the area five measures before m. 254. Using the rhythmic *ritardando* controls the rate at which rhythmic tension decreases, serving as a tempo transition to the subsequent character area. As seen in Example 3.6 the bass clarinet, bassoon, and double bassoon initiate rhythmic *ritardando* at m. 249, which the audience perceives as a reduction in tempo.

Example 3.6: *Gran Duo*, mm. 249-257. Rhythmic ritardando initiated by the bass clarinet, bassoon, and double bassoon at m. 249.



Gran Duo by Magnus Lindberg

An *accelerando* added in the score increases the level of tension in mm. 252-253. Looking back at Example 3.5 this tension is visible in the area marked with an arrow just before letter D. The conductor is able to use the graph to gauge at what rate the *accelerando* must advance in order to accurately prepare the tempo for the subsequent character area. Pacing of the *accelerando* relies on the conductor's knowledge of Lindberg's rhythmic *ritardando* during the transition of the last character area in Movement II.

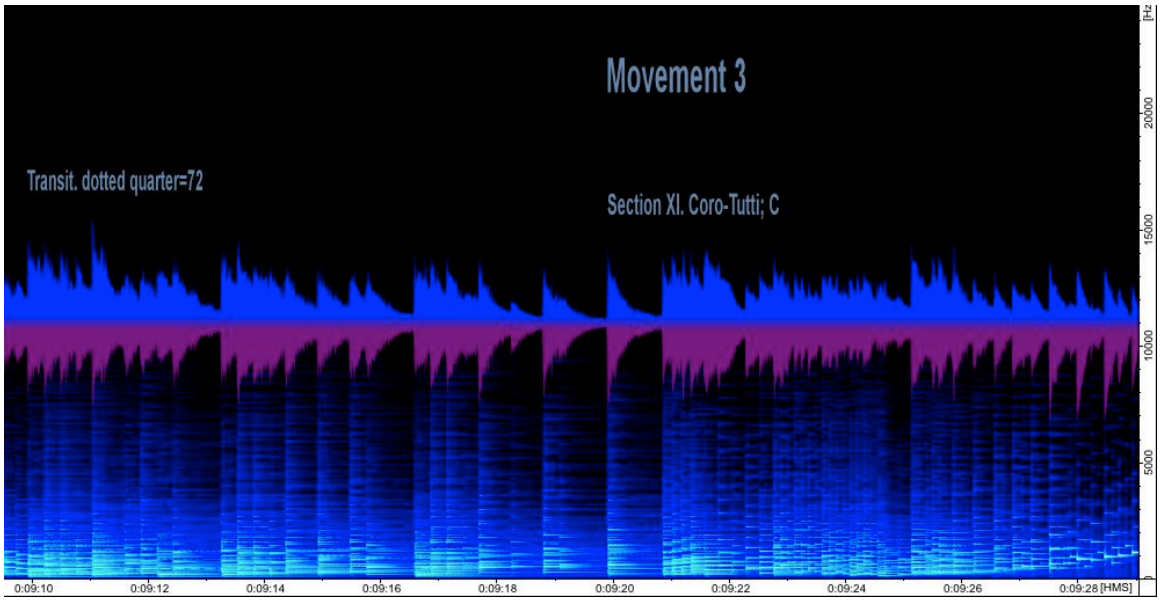
The final character area in Movement II is a brief three-measure transition statement. Character material from Transition I is used to create a pause, or a ritard gesture, as Lindberg labels the area in his sketches. Three measures before Section IX, m. 258, an increase in

harmonic tension creates a transition leading into the third movement. Example 3.7 provides evidence of this harmonic tension. Columns of light blue at the bottom of the graph become wider displaying the rate at which harmonic changes occur. The orchestration moves from high woodwind and brass descending pentatonic figures, mm. 254-257, to the low reeds and brass descending figures. The shift in orchestration creates a darker atmosphere used to offset the previous pentatonic line creating a dramatic change in texture, timbre, and rhythm during the transition. Lindberg combines density of harmony and texture to reflect tension created between the brass and woodwind families as they move into the third movement. Energy at the end of Movement II dissolves as shown in Example 3.7, mm. 258-260. Thinning light blue lines on the spectral graph indicate a decline of energy. The two brief fermatas framed around silence provide a pause, which is the only indication that the second movement has concluded.

Movement III begins with an increase in rhythmic activity, m. 261. On the spectral graph the rhythmic activity is displayed as disconnected light blue lines. This spectral activity is a visual contrast to the thick connected light blue lines of the first half of Example

3.7 representing the end of Movement II. The graph is an overview of contrast in the area between Movement II and Movement III. Texture changes during this transition create tension through dynamic contrast and rhythmic ideas. The columns of spectral energy on the graph represent the build and decay of tension created in the two fermatas, mm. 258-259. An illustration at the close of Movement II is viewed on the graph between 0:09:18 and 0:09:21.

Example 3.7: *Gran Duo,* mm. 258-266. Increase in tension during the transition prior to Movement III.



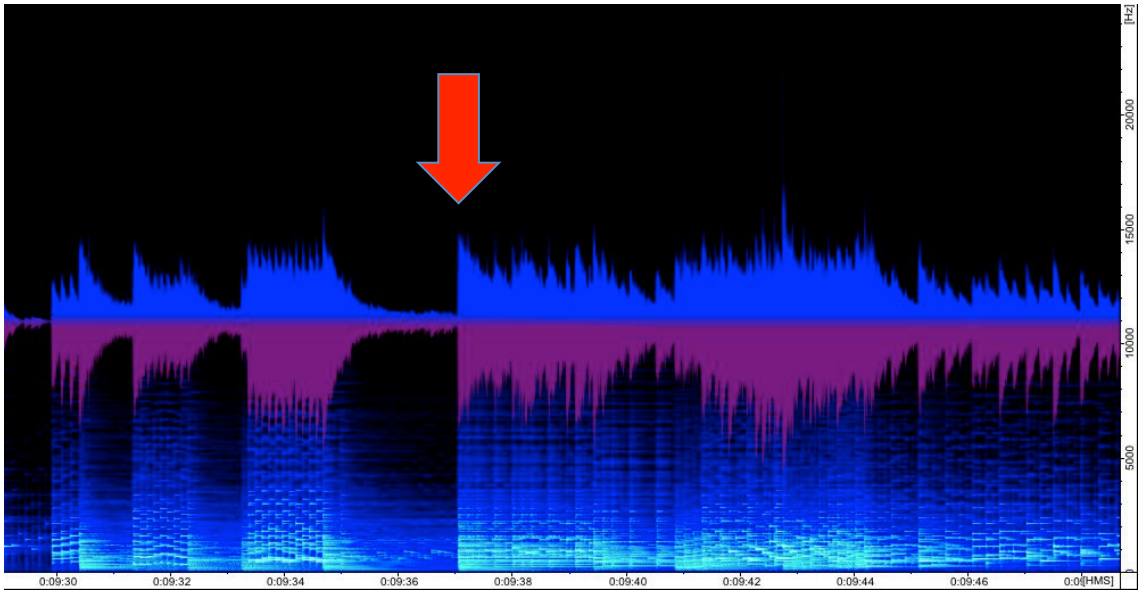
Previous texture analysis focused on the communication between the brass and woodwind families. Narrowing the focus of the analysis to the brass family helps to examine rhythm in relation to texture between mm.

267 and 269. Lindberg's rhythmic use of long and short rhythms, sustained half notes in the trombones and tuba paired with sixteenth notes in the trumpets and horns, create a thick texture mimicking a tense conversation between the brass sections. Lindberg's orchestration increases the tension by creating a harsh metallic articulation that easily projects through the ensemble. The mixture of contrasting rhythmic patterns adds to the dramatic energy of this anxious conversation.

The placement of the arrow in Example 3.8 draws attention to m. 270, which marks the entrance of the flute, oboe, and horn along with a sudden increase in spectral and sound wave activity at 0:09:37. Lindberg uses polyrhythmic material and dense harmonies as a means of increasing tension. In the horn section a rhythmically aggressive triplet motive pushes melodic and harmonic tension to the forefront. This tension becomes a new area of focus for the conductor causing the need to equally balance the dynamic of the flutes, oboes, and horns. Tension reflects an increase of rhythmic and harmonic conflict between the flutes, oboes, and horns. To the conductor this spike in spectral and sound wave activity represents a sudden change of texture. A polyphonic

eruption redirects the flow of energy affecting a decay of tension into Section XII, m. 286.

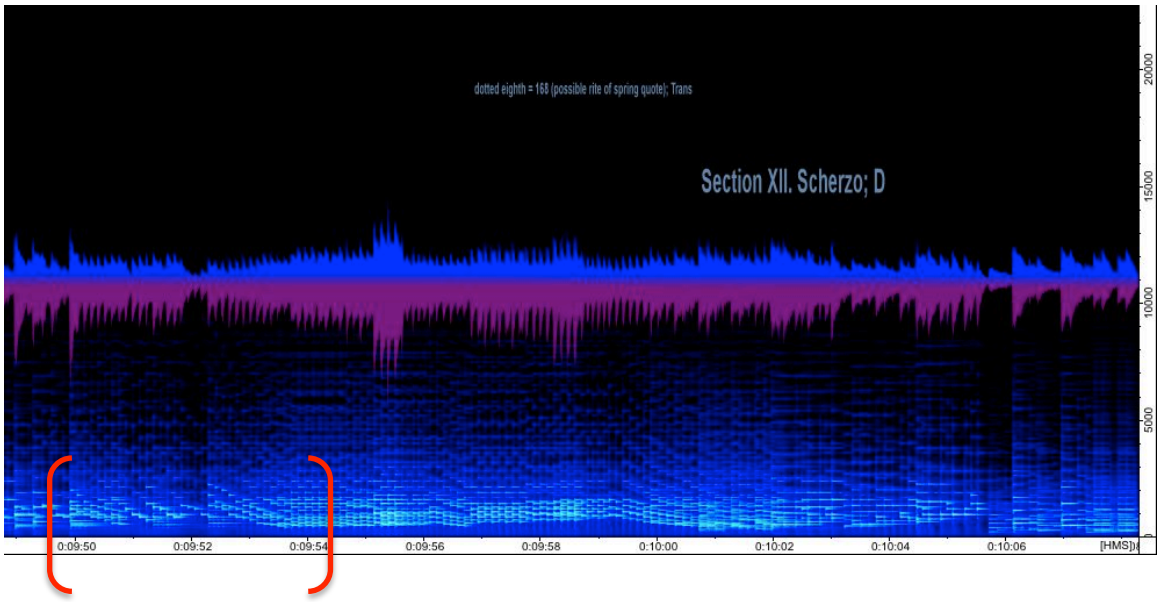
Example 3.8: *Gran Duo,* mm. 267-272. Entrance of the flute, oboe, and horn marked with an arrow, m. 270.



In addition to revealing textural changes in the score the spectral graph can be used to display the contour of the melodic line. The change of contour in the melody can be viewed between the two brackets in Example 3.9. Beginning at m. 273 the area between the brackets focuses on the descending chromatic melodic material of the flute and clarinet moving into Section XII. The spectral graph brings focus to the melodic line, provides a clear representation of the descending melodic area, and makes a case to balance the chromatic line against the

other non-melodic material, such as the trumpet fanfare figures in mm. 274-281.

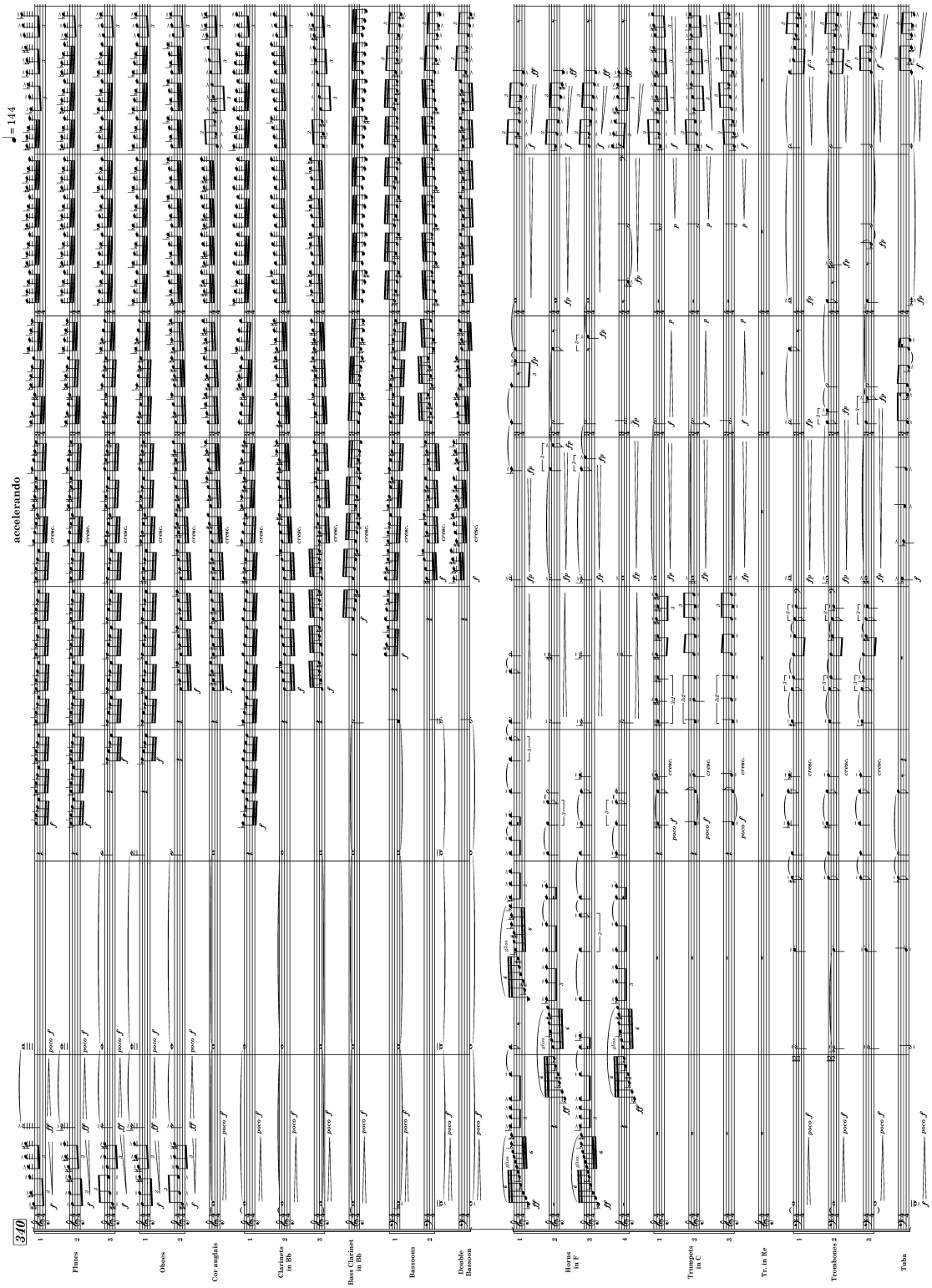
Example 3.9: *Gran Duo*, mm. 273-290. Melodic lines in the flute and clarinet appear after spectral illustration.



As a reference tool the spectral graph charts the increase and decrease of tension throughout the eight character areas. Using this information provides a visual representation of texture and dynamic contrast to identify patterns throughout the composition impacting decisions, particularly for balance and blend during rehearsal. Spectral information can also assist the conductor with estimating the amount of dynamic change preferred in the character areas. Each character's rate of dynamic change is visible throughout the entire composition and is found in Appendix C.

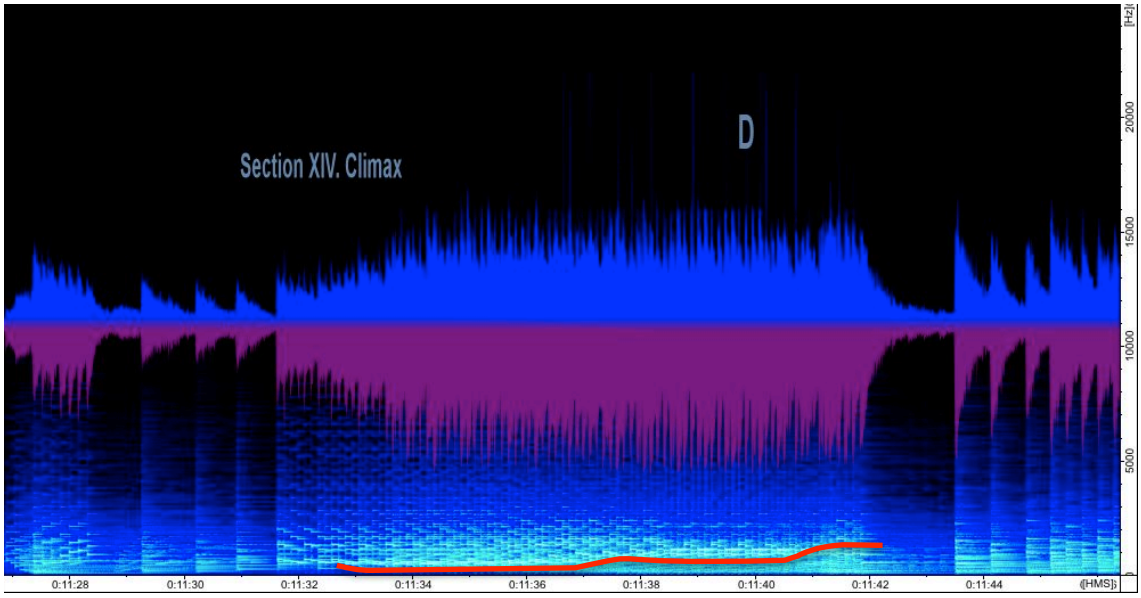
Example 3.10, which depicts the introduction of Section XIV “Climax,” illustrates an increase in dynamic, harmonic, and rhythmic tension. In Example 3.10, tension builds beginning at m. 342 with an ascending and descending rhythmic sixteenth-note pattern in the woodwinds paired with the harmonically dense chords in the brass. This energy is outlined as a red line on the spectral graph in Example 3.11. Tension is created in two parts. The first is an ascending chromatic line found in the second oboe, cor anglais, and second/third clarinet. The second area of tension is created with a contrasting descending chromatic line found in the flutes, clarinet 1, bass clarinet, and bassoon 1. At m. 344 a pattern of four sixteenth notes appears, each beginning at an interval higher or lower than the previous set. One ascending pattern and one descending pattern provide contrasting motion through each of the woodwind lines.

Example 3.10: *Gran Duo,* mm. 340-347. Beginning at m. 342, woodwind ascending and descending chromatic sixteenth note pattern.



The *crescendo* in the woodwinds and brass work together creating an ascending line that appears in the spectral graph, Example 3.11. This ascending line on the spectral graph reflects an increase in hertz highlighting the ascending melodic chromatic passage of the texturally dense area between mm. 344 and 347.

Example 3.11: *Gran Duo*, mm. 340-350. The red line highlights the ascending chromatic melody mm. 344-349, also bringing attention to the peak of dynamic contrast.



The red line in Example 3.11 reveals an ascending chromatic motive found in the first flute, cor anglais, third clarinet, and trumpets, m. 347. Polyrhythms, chromatic lines, and an increase of tempo marked as D in Example 3.11 illustrates the peak of tension during

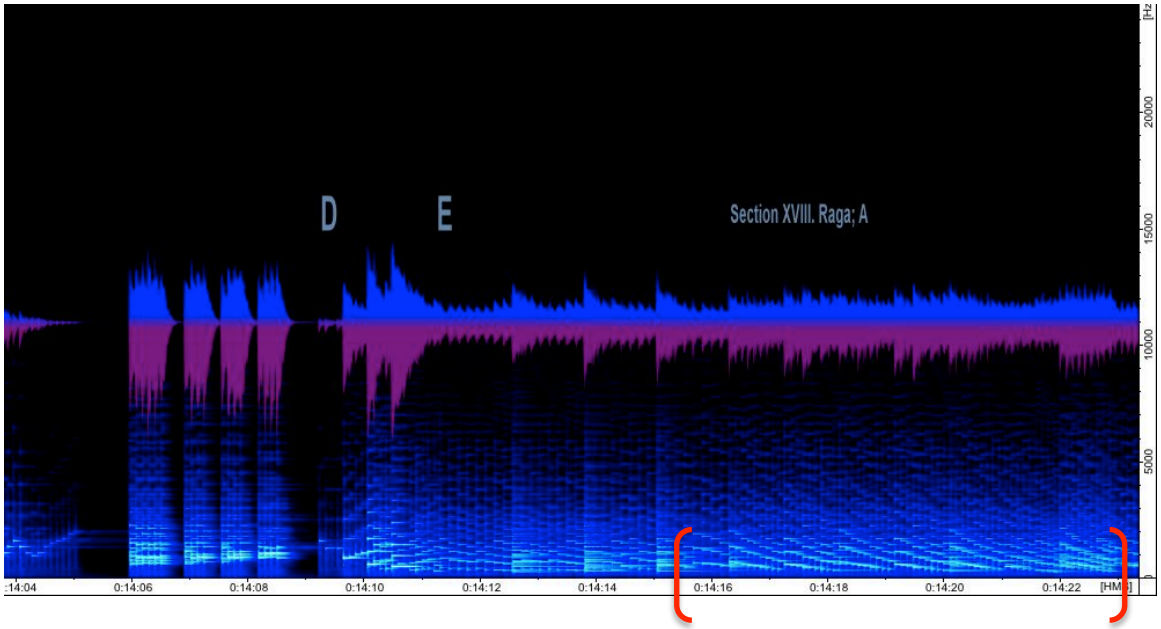
Section XIV. The dynamic marking *fortississimo*, mm. 348-349, is also the maximum dynamic level of the composition. Following the peak of dynamics a steady decrease in energy occurs. Activity displayed on the spectral graphs in Appendix C reveal the decline of energy beginning at m. 349—the last quarter of the composition.

In Section XVIII "Raga," mm. 419-434, it becomes particularly challenging to find melodic and harmonic material due to the density of texture. The spectral graph lends clarity for the conductor in regard to balance of melody and harmony. Spectral activity found between the brackets in Example 3.12, mm. 421-423, illustrates the descending chromatic line. The collection of data from the spectral graph confirms the descending line is melody, allowing the conductor to balance the ensemble.

The harmonic material of this section is from Character A. Extended techniques enhance the harmony by creating timbre effects with stopped and open muting in the trumpets and trombones, which adds color to the character area. The added color from the varying mutes, while using stopped and open mute techniques in the trumpet and trombone, provide harmonic support to the melodic (pitch) material from Character A.

During score study the conductor observes the pattern and method in which active rhythmic figures are used to influence rhythmic tension. Tempo can enhance the increase or decrease of tension, providing an additional element for Lindberg to make modifications to influence the density of rhythm as seen in Example 3.12.

Example 3.12: *Gran Duo*, mm. 412-423. Tempo as it impacts rhythmic tension in Section XVII. Descending chromatic ideas in Section XVIII reveals melodic material.



Lindberg's change of tempo creates tension, which is illustrated on the graph in the area marked "D" m. 415 quarter note = 144, "E" m. 417 where quarter note = 96, and Section XVIII m. 419 where dotted quarter note = 63. This quick succession of tempi creates a false perception of change. The significance is that the audience observes

the conductor's beat becoming slower while the rhythmic pulse is heard at a constant rate. Due to metric modulation the audience is unaware of the change from duple to triple as marked in the score.

Recreating precise tempo changes is a skilled task for any conductor, however Lindberg goes a step beyond the reduction of tempo to create tension. The tempo reduction causes an increase of tension, not a reduction of tension. Lindberg unusually reduces pulse to increase the level of tension found in the transition to draw attention to the rhythmic and harmonic change.

In closing, the selected sections illustrate methods in which texture defines the structural form of *Gran Duo*. Information from this chapter also offers insight for balancing the dense textural elements of rhythm, harmony, and melody. Data from the spectral graphs illustrates that texture contributes significantly to the understanding of *Gran Duo's* formal design. Discovering the composition's character areas reveals how Lindberg uniquely organizes each area to fit the formal structure of the work. The design of the formal structure is found in texture traits located in each character area's melodic, harmonic, and rhythmic elements.

In the next chapter a rhythmic analysis will provide information and background for realizing the function of Lindberg's computer-assisted composition program and how it is used for designing *Gran Duo's* rhythmic structure.

CHAPTER 4: RHYTHM AND TIMBRE

Lindberg's development of rhythmic ideas, similar to texture, contributes to the formal structure of the composition. Information from the composer's character sketches provides background details for the analysis of rhythm in *Gran Duo.* Before explaining how the rhythmic areas relate to form it is important to understand how Lindberg's use of computer-assisted composition (CAC) plays an important role in the development of rhythmic ideas.

Lindberg uses the computer program *Patchwork* to create parameters for the rhythmic foundation in his compositions. The development of the computer program at IRCAM allowed composers to control musical elements independently. Composers would be able to use *Patchwork* to change only one parameter without affecting the other elements of music. The specific details about the design of the program and its ability to process variable rhythmic combinations will not be addressed in this document. However, this information is available should the reader be interested in *Patchwork's* software design and its use as a storage bank of rhythms.

RHYTHM

During the planning stage, Lindberg organizes specific compositional objectives and goals with the aid of *Patchwork*. The computer is not allowed to have total control over the selection of rhythms, but instead is used to generate algorithms aiding in complex mathematical decisions that create rhythmic tension and release in music. One example of rhythmic tension and release is Lindberg's use of rhythmic retardation to create a perception in the change of pulse. As mentioned in the previous chapter, the audience perceives the pulse changing at a different rate of speed than what the conductor is actually conducting. This means rhythm is used to create a specific rate of change in tempo, which is not provided at the conductor's discretion but rather dictated by metric modulation as revealed in Chapter 3, Example 3.12. Lindberg creates changes in tempo without actually altering the continuation of pulse, which transforms how rhythmic energy and tension is increased or decreased in a character area. Understanding the degree of emphasis in rhythmic elements, such as rhythmic retardation, allows the conductor to more closely determine the composer's intent in style and phrasing for each character area.

TIMBRE

Each character area is defined by three traits: tempo, rhythm, and pitch. Timbre allows for the division of woodwind and brass members throughout each of the character areas. Timbre in each character area is defined as the physical characteristics of sound, and the changes these sounds go through during the return of character material.

Lindberg begins the composition with a division of brass and woodwind colors, utilizing the timbral differences of the two families. After the climax in m. 348 the distinct separation between brass and woodwinds begins to blur as Lindberg morphs the two families into one timbre during the last quarter of the composition. Before the climax, character material was found to be associated with brass or woodwind timbres individually. It is during the last two movements following the climax that Lindberg explores character material in different timbres.

The byproduct of morphing character material creates cohesive brass and woodwind timbres, which create a new color to complete the conversation and the composition. This closure of the composition reflects a change in thought and the transformation of ideas that take place during the conversation.

HARMONIC RHYTHM

Harmonic rhythm is an additional element creating tension and release. Lindberg's work with the computer program *Patchwork* alters the harmonic rhythm varying its rate of change in the chaconne. Based on the rate at which Lindberg chooses to change the harmonic rhythm the rate of change draws the audience into the music or lets the audience drift away. An example of this rate of harmonic change can be viewed in *Gran Duo's* first twenty-six measures where harmonies change over fifteen times. A rapid harmonic change increases the level of dramatic impact, as if suggesting the woodwind conversation is baiting the brass to respond. Two tempi are used during the introduction; the woodwind entrance is indicated dotted quarter note = 63 and the brass at quarter note = 84. The eighth note subdivision is the catalyst for change in the pulse beginning with a triple rhythm at the entrance of the woodwinds and later changing to a duple rhythm at the entrance of the brass, as seen previously in Example 3.2.

RHYTHMIC AND TEMPO MOTIVE

The first four measures, mirrored rhythms in the oboe in combination with interval-class vector <322431>,

introduce Character A.[30] The mirroring of rhythmic ideas begins with a long duration leading to a group of articulated descending notes followed by two quarter notes and ending with a group of articulated ascending pitches, Example 5.2. The harmonic change during this opening fanfare remains static to focus on the pitch material presented for Character A. This area when played in reverse is a reflection of the introductory rhythm. The rhythmic and melodic figures work well as a mirrored rhythm. Lindberg uses rhythmic mirroring to solidify the interval-class vector <322431> in the audience's ear. The retrograde of this figure is another reinforcement of the pitch material's association with Character A. Although the rhythm is not an exact copy, the pitch order is a perfect mirror. The use of mirroring reinforces the ear with pitch material used to define Character A.

In order to locate subsequent characters, a conductor might look for similar rhythmic ideas or themes. The return of rhythmic motives can be literal or in variation. When a character appears in variation, the tempo and pitch material become significant traits for determining the character. Changes that occur in rhythmic motives suggest

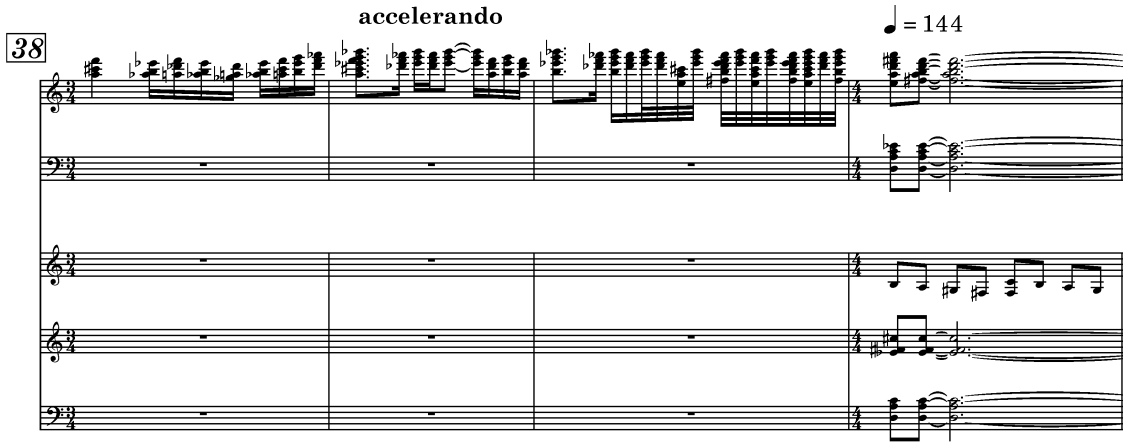
[30] The interval-class vector is derived from the hexachord of the wide scale. The two hexachords found in the wide scale correspond to the interval-class vector specific to each character.

an organic form to the composition. The organic form is realized as the altering of rhythmic material, which reflects the conversational nature of the work as echoed in the compositional design.

In order to appreciate Lindberg's practice of tempo organization there are two different components to explore: transition between character areas and the creation of tension and release within character areas. With the creation of a tempo graph, Appendix B, the pattern of identical tempo markings appears during the first movement of Sections I and II. Lindberg increases the length of character areas during Section II, adding additional time for transitional elements. Several of the transitions are used to increase tempo, specifically when the tempo change reflects an entrance of a new character. It appears that the increase of tempo can be linked to an energetic or anxious speech pattern of someone asking a question. Linking the tempo increase to a conversational pattern prior to the new character area affirms the organic nature of a conversation. Lindberg uses tempo and rhythm to mimic conversational patterns, as if someone attempts to get in a last word before being interrupted. Lindberg makes a conversational connection, as if asking a question where the inflection rises at the end of the

sentence cueing the listener for a response. Example 4.1 in mm. 38-41 isolates a transition where Lindberg uses rhythmic intensity to mimic the vocal inflection of speech.

Example 4.1: *Gran Duo*, mm. 38-41. Rhythmic intensity mimics the vocal inflection of speech.



In the example both an *accelerando* and an increase of rhythmic activity work together to create an energetic transition. This transition calls for a response from Character D. The type of question and answer banter found in the musical line reflects the composer's intent to replicate a conversation.

TEMPO

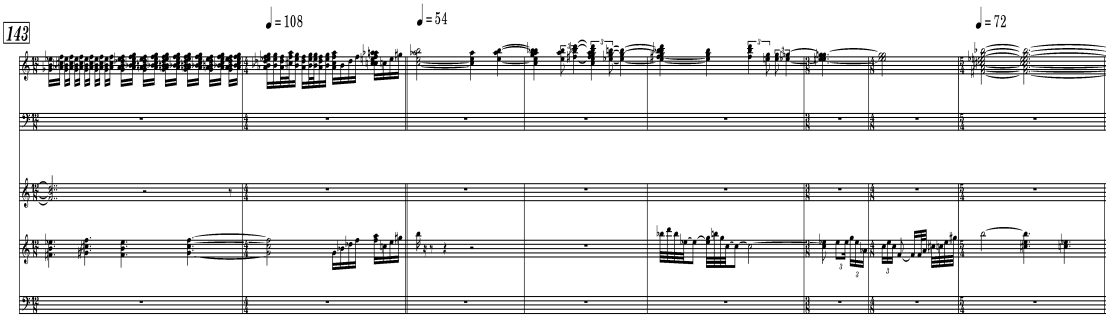
To define character areas and become more specific about the return of character material, a tempo marking

assists with the conductor's identification of all character areas. As mentioned, the tempo chart in Appendix B provides a visible pattern to identify structural elements. The conductor will be able to easily identify specific character areas based on tempo, exposing the formal structure of the composition.

Character areas do not consistently have the same rhythmic form but can be identified by their "individual characteristics" or listed tempo. As the conversation between woodwinds and brass develop, a change in the character's rhythm and melody occurs—emulating the change a conversation undergoes when both parties share ideas and viewpoints. The character area material found in the woodwinds and brass does not repeat during the restatement, which affects how each of the characters transform rhythmically and melodically during the course of the conversation. Lindberg eventually interjects ideas from other characters modifying the direction in which the discussion moves.

Additional rhythmic and texture developments rely on a change of tempi to influence the degree of tension in character areas as seen in mm. 143-150, Example 4.2.

Example 4.2: *Gran Duo*, mm. 143-150. Tempi changes used to influence tension during the transition between Section IV and V.

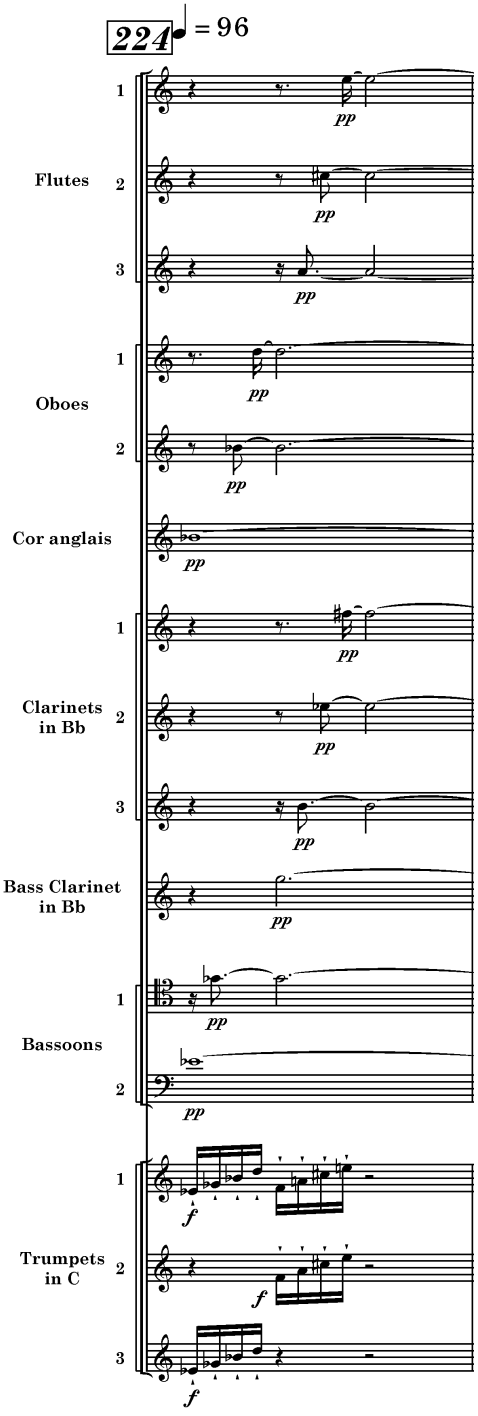


The three character areas in Example 4.2 change in quick succession. At first it is difficult to determine if this section of music is a quick exchange in conversation between characters, to be used only as transitional material, or a combination of both transition and quick exchange between characters. Could this section be labeled as Character F although the content does not reflect the tempo marking for all three measures? Is Section V “High Descending” a transition area that breaks the rules? Because Lindberg does not adhere to traditional elements of form, and due to the organic nature of this composition, character areas do not follow traditional structural forms. The previously collected information from the spectral graph confirms that this area is a transition between Section IV and V. The pitch material found in Character F and the quick conversational exchange

between multiple characters is used to pinpoint the transition between these two sections. This transition can be viewed as the quick interjection of goodbyes between friends after an impromptu conversation.

Movement II, a transitional movement, contains various texture changes used to create rhythmic and harmonic tension. Rhythmic activity seen in Example 4.3, m. 224, begins with three trumpets. The trumpet's rhythmic sixteenth notes act as an initiating gesture, which is used to quickly introduce a sustained line of harmony in the woodwinds.

Example 4.3: *Gran Duo*, m. 224. The rhythmic activity in the trumpets articulate the harmonic sustain of the woodwinds.



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Example 4.3 is a unique combination of rhythm and timbre. The trumpets rhythmically introduce pitch content interval-class vector <241422> and a tempo of quarter note = 96 labeling this as Character E. The pitch content sustained by the woodwinds presents an opportunity for the conductor to view the wide scale for Character E.

The trumpet color delivers sharp articulations needed to announce the sustained harmonies of the woodwinds. The articulation effect from the trumpets is used to pull the audience's attention into the second movement. The ear is caught off guard due to the machine gun articulation from the trumpet. Eventually the ear is acquainted with the pitch material due to the woodwind sustain of tones introduced by the trumpet articulation.

Lindberg adds a *rallentando* that offers the ear more time to absorb the pitches. The increase of time allows the conductor to determine how much sound is appropriate for these harmonies to resonate in the concert hall. The amount of variance in tempo is an important point of focus for the conductor to consider because the anticipation of the next tempo is critical as Lindberg does not provide a tempo marking until m. 233.

CLIMAX

The conversation between mm. 315 and 350 moves with purpose amongst several rapid block-scoring passages upsetting the brass and woodwind characters. The thirty-two measures between Character C and D of Movement III is the longest stretch in the composition to not undergo a tempo change. During the thirty-two measures Lindberg pairs woodwinds against brass to increase the texture's density by strengthening the discussion between the two instrument families.

The rhythmic activity intensifies at m. 335, indicating a change in the nature of the conversation. A triplet rhythmic idea in the brass serves as a motor moving the conversation forward. Sustained pitches in the woodwinds can be located in the triplet rhythmic statement of the brass. Again, woodwinds are used to outline the wide scale representing Character C, m. 337. A triple pulse previously introduced by the brass changes to a duple pulse, which is followed by a series of sixteenth note entrances in the woodwinds.

Without a change of tempo the ten changes of meter become important during Section XIII for providing variation in the rhythmic phrase length. Block scoring provides a clear division of timbre between brass and

woodwinds as they play out a scenario in which the two families express an interest in each other's reply. A series of arguments beginning in m. 340 with the ascending triplet rhythms leads the audience to believe the intensity of the conversation will soon change to an exciting display of emotionally charged fireworks between the brass and woodwind families.

The wide ambitus[31] and the rhythmic motive in the horns at mm. 340-341 create tension, drawing notice to the changing rhythmic structure between duple and triple pulse. The rhythmic ritard in m. 342 could cause a reduction of tempo, however the consistent sixteenth note subdivision of rhythm in the woodwinds maintains a steady pulse.

The tension increases due to contrasting rhythmic patterns from a gradual addition of woodwind timbres at m. 342. Every two beats woodwinds enter with both descending and ascending chromatic lines as seen in Chapter 3, Example 3.10. An *accelerando* is added to the chromatic and contrary motion of the woodwinds doubling the tension of the conversation. The same wide scale associated with the beginning of Section XIV "Climax" continues to provide the brass harmonic material. Beginning in m. 344, Section XIV

[31] Range of melody.

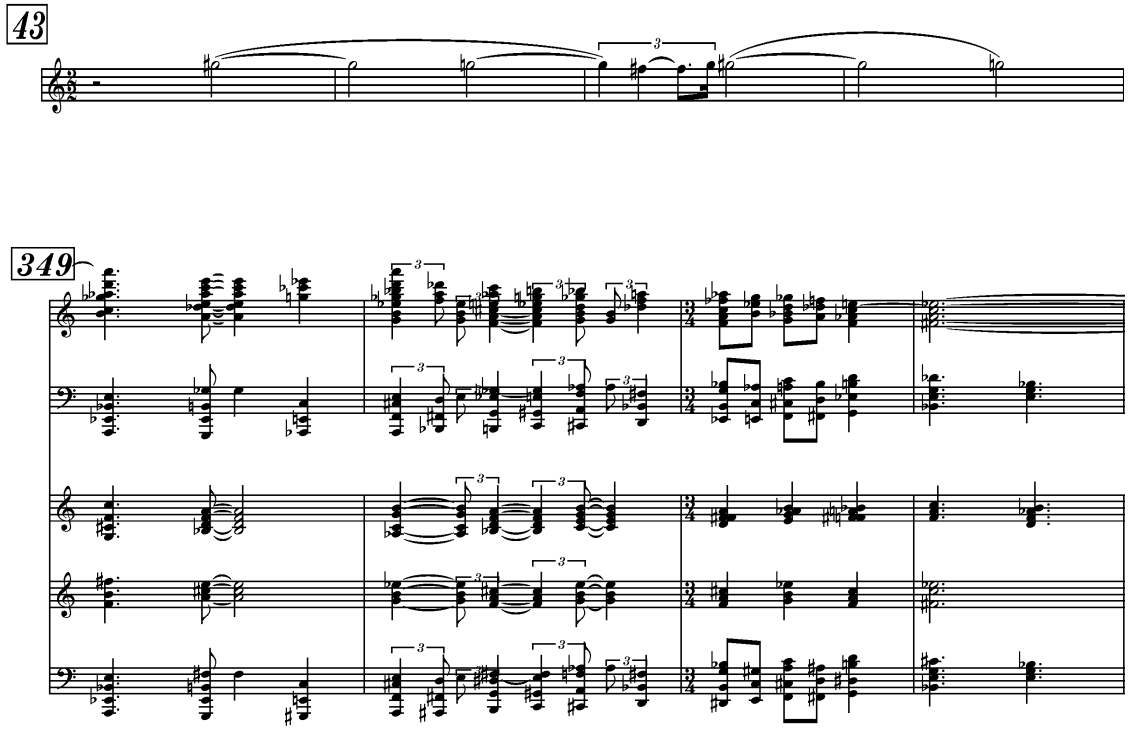
"Climax," the *fortepiano crescendo* allows the brass to move into the foreground before retreating behind the woodwind line. These dynamic changes utilize the brass timbre to enhance the texture change.

Remarkably, the tuba provides the only melodic material in this idea entering at m. 344. The tuba's descending G-flat melodic minor scale with raised fifth scale degree creates harmonic interest when heard against the other voices. The conductor should approach the balance of the ensemble so that the tuba voice is used to reveal the added melodic tension. Balancing the ensemble to the tuba allows its dark timbre to serve as a contrast to the tension of the surrounding rhythmic elements.

The conductor must also monitor the dynamic effects of the cluster chords starting in m. 344. Balancing the rate of *crescendo* and *accelerando* becomes substantial so as to not overpower the ensemble prior to the climax of the work five measures later. The texture becomes increasingly dense at this point suggesting a peak of tension approaches. Prior to the *fortississimo* dynamic marking Lindberg labels the tempo quarter note = 144, indicating that a new character has entered the conversation.

At m. 348 an explosion of tension overtakes the rhythmic fight of duple against triple pulse between the woodwind and brass characters. Lindberg plans for Character D to enter the conversation at the peak of tension to provide a wave of stability against the unsettled sea of emotion. Interestingly, Character D sketches show that rhythmic ideas have been borrowed from Debussy's *La Mer,* as referenced in Example 4.4.

Example 4.4: *La Mer,* III. Dialogue du vent de la mer, mm. 9-12. *Gran Duo*, mm. 349-352. Rhythmic concepts from *La Mer* used as rhythmic inspiration in *Gran Duo* mm. 349-352.



Lindberg increases tension beginning at m. 340 for eight measures referencing Debussy's great wave crashing against the shore as a metaphor borrowed from *La Mer*. Lindberg specifically selects Debussy's rhythmic idea from *La Mer* to indicate an increase of tension and then release. Lindberg imitates Debussy's wave like swell by slowly creating a pulsating tension, a force that presses into the climax. The conductor will find that balancing harmonic tension aided by crescendos and decrescendos is of equal importance to maintaining an accurate increase of tempo m. 344. The release of tension in m. 348 is only possible if the elements of texture, timbre, and rhythm are increased in equal proportion. If these elements are not balanced equally the arrival at m. 348 will not affect the audience with the same emotional and aesthetic impact, as does Debussy's *La Mer* conveying the energy of waves crashing upon a shore.

Following m. 354, the texture thins to reduce tension created during the climax. At this point the conductor assists with the pacing and acts as a mediator for the brass and woodwind argument. The conductor's awareness of the reduction in tension becomes the primary focus in this area. A secondary area of focus becomes how the redirection of tension will occur for the remaining

character areas. Referring to Einstein's quote, "Energy cannot be created or destroyed, it can only be changed from one form to another," we discover that energy used to create the "Climax" must be transferred throughout the remaining character areas of the composition. The redirection of tension appears during the final two movements when several characters attempt to recreate tension in the conversation. However, the rhythmic elements from these character areas do not create the same level of aggressive energy as compared to the level found during the build of the "Climax."

The conversation between woodwinds and brass does not resolve in a compromise or with an amicable parting. Therefore, the amount of tension released in the section following the climax must not dissipate quickly. Rather, the tension never releases and is ever more present during the final nine measures of the composition. The lack of agreement and understanding between the brass and woodwind families fuel the remaining rhythmic tension during the final character area.

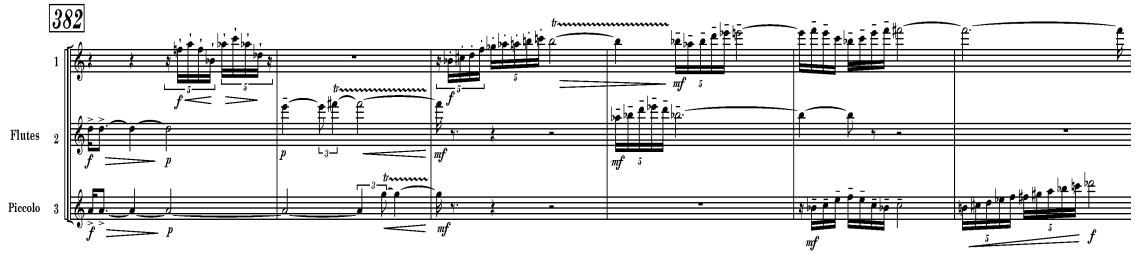
Following the climax, several *cadenza*-like figures beginning in m. 365 assist with a redirection of tension. The aftermath of tension found in the build up of rhythmic and harmonic elements give way to chamber-like textures,

which focus on the release of tension through texture change and the reduction of individual voices. Lindberg explores individual textures to cleanse the palate and quickly reduce tension from the larger sound masses.

An interlude between the three flutes, mm. 365 and 392, reduces texture in the woodwind section while also reducing the rhythmic tension with the coordination of duple and triple rhythms found previously during the climax. The oboe at m. 373 and piccolo at m. 381 join the conversation adding a soprano-heavy timbre during these twenty-seven measures. The conversation between the flutes carries on as if the three voices are attempting to discern who was the victor of the climatic conversation.

Pitch material in m. 380 from Character E is another clear example of Lindberg's wide scale. Lindberg uses a cascading melodic line divided between the two flute parts making it easy to identify the wide scale material. Flute and piccolo harmonies create a contrasting line that provides forward motion for the chaconne. This harmonic alignment keeps the conversation from becoming stagnant. Example 4.5 displays Lindberg's harmonic grouping of the three voices, two flutes and piccolo, mm. 382-387.

Example 4.5: *Gran Duo*, mm. 382-387. Displaying Lindberg's harmonic grouping of flutes and piccolo.



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The woodwind family performs a leading role in the redirection of tension following the climax. This role has allowed the brass section to return at m. 393 with familiar material found in Character A. Following a brief pause of the two flutes and piccolo, a tempo and pitch reference to Character F, quarter note = 72, is followed by a return of Character A material. If the conductor is still uncertain about the presence of Character A, rhythmic elements are found in the triple pulse and pitch elements in interval-class vector <322431>. These rhythmic and pitch elements can be traced to Character A traits.

Lindberg changes the timbre from the first appearance of Character A, changing it from the woodwind voice to the brass voice. Altering the orchestration and timbre of this character trait allows Lindberg to blur a previously clear division between brass and woodwinds. The elements of timbre and color serve as character traits and allow

specific boundaries such as tempo and timbre to assist in defining each of the characters. Lindberg's use of the brass *arpeggio* at m. 401 provides a harmonic nudge to guide the conversation into the return of Character A.

In closing, timbre and rhythm work together for defining character areas and also work separately to identify structural elements of form. Lindberg composes *Gran Duo* utilizing brass and woodwind voices as characters in a conversation. As fascinating colors and textures wash over our ears Lindberg employs elements of texture, timbre, and rhythm to diagram a conversation between eight different characters. Several examples illustrate how a character is defined by rhythmic motives and timbre. The change of timbre for a specific character creates a change that reflects the mood and direction of the conversation. Further, Lindberg creates rhythm, pitch, and tempo traits that define characters whose ideas transform and develop throughout the conversation. The organic nature of the conversation is clearly characterized in the form of *Gran Duo.*

In Chapter 3 spectral graphs assisted with the identification of textural activities becoming an important factor for determining the construction of character areas. Chapter 4 revealed how these same rhythms

create points of tension and release used to identify character areas. The next chapter highlights the use of texture, timbre, and rhythm as traits to identify each of the eight characters.

CHAPTER 5: CHARACTER AREAS

In the previous three chapters spectral graphs defined *Gran Duo's* structure with information from texture, timbre, and rhythm. Chapter 5 presents Lindberg's sketch material and reveals more specific texture, timbre, and rhythmic ideas used to identify each of the eight character areas. In addition, pitch sketches will illustrate individual wide scales, displaying pitch material specific to each of the eight areas. As previously stated in Chapter 2, Marcus Castrén's article provided an in-depth view on the creation of the wide scale and its use among the eight character areas. However, for the analysis of texture, timbre, and rhythm in relation to the work's formal structure, Castrén's pitch information will not appear in this chapter. While Castrén's article focuses on pitch organization, Lindberg's sketches better illustrate texture, timbre, and rhythm as fundamental to the organic structure of *Gran Duo.*

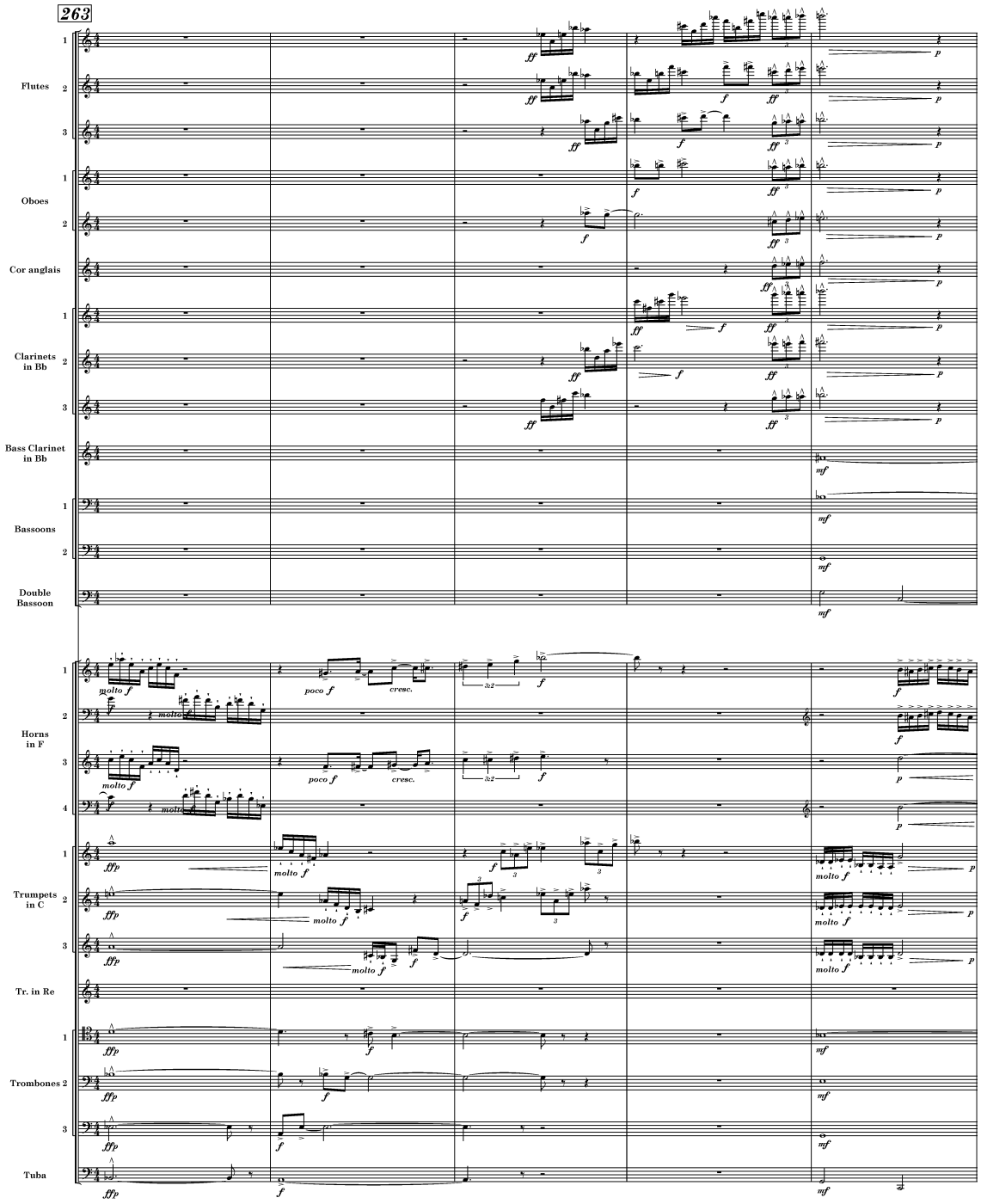
As stated in Chapter 2, the work is organized into eight character areas: A, B, C, Transition I, Transition II, D, E, and F. Lindberg labels the characters separately in the sketches, presumably as part of the composer's pre-composition process. Importantly, this labeling

information does not appear in the published score. Each character sketch lists specific information regarding tempo, rhythm, and its corresponding wide scale. These three elements play a vital role in identifying the personality of each character. Interestingly, dynamic indications appear only in sketches for Characters A, C, and Transitions I and II. The dynamic labels do not appear in the published score; further examination suggests that Lindberg realizes this expressive feature primarily through texture. The juxtaposition of pitch and dynamic contrast provides a channel for textural contrast in the character design.

In addition to the above elements, various sketches list specific pitch intervals for each character. This material is listed as the character's interval-class vector. Found only in Characters A, B, C, and D, information listed provides a connection to pitch material used during a character's appearance. Interval-class vectors for Characters E, F, and Transition I and II are confirmed from the wide scale sketches; information is available through analysis of the wide scale provided from the sketch. An understanding of pitch material for the transition characters will be discussed in this chapter.

Lindberg's character sketches include rhythmic motives, tempo indications, and textural information to guide the composition of melody, counter melody, harmony, and rhythm. The character sketch elements Lindberg uses can be related to how an author or playwright describes and illustrates a character's personality. Each character has a specific tempo, rhythm, and pitch element to assist with its identification. Texture and timbre are also used to divide the brass and woodwind families as an indication of the dual properties the two families serve in the conversation. In the score the separation of woodwind and brass texture and timbre can be viewed in Character C, mm. 263-267 Example 5.1.

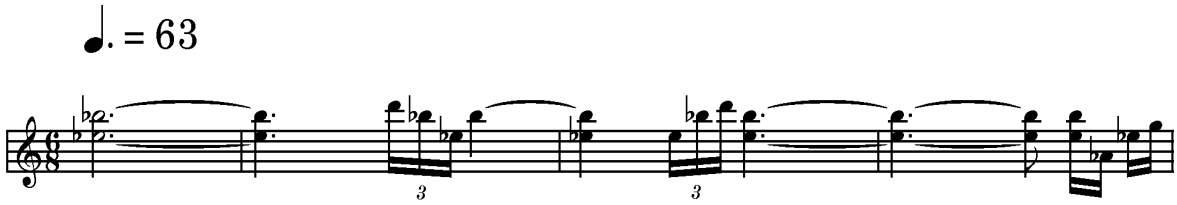
Example 5.1: *Gran Duo*, mm. 263-267. The separation of brass and woodwind timbres during Character C.



Characters are introduced in the following order during the first ninety-six measures: A, B, C, Transition I, Transition II, D, E, and F. Following a lengthy ninety-six measure double introduction of each character in succession Lindberg moves to a development of character material in what could be perceived as random ordering for the remainder of the composition. The order is based on a variety of situations that either follow the progression of the chaconne by varying the length of the character area or act as a response to another character area—as if in conversation. Therefore, these adjustments to the length of character areas impact the formal design in a nontraditional way, one that has been influenced by the natural flow and sequence of a conversation.

The unique personality traits of the eight characters create discernable patterns used in the visualization of the composition's formal structure. The first of these character patterns begins with an opening rhythmic line in the oboe. The symmetrical line, a palindrome of pitch and rhythm, combines rhythmic and pitch content found in Character A, Example 5.2.

Example 5.2: *Gran Duo*, short score mm. 1-4. Introduction of Character A material in the oboe, showing the symmetrical rhythm.



The harmonic and rhythmic idea of this symmetrical rhythm can be performed from measure one to measure four, or performed as a retrograde starting on the fourth measure at the fourth eighth note. Lindberg lists this rhythmic figure in his sketch material as *symmetrical rhythm,* meaning the figure can be performed forward or backward with the same results for the audience. Lindberg uses this rhythmic palindrome as literal and psychological reinforcement for the pitch material in Character A. Although the audience will never experience a reverse performance of this opening line the conductor will find the retrograde of this figure interesting when locating Character A for the first time. The palindrome emphasizes the interval-class vector associated with all appearances of Character A, <322431> paired with a tempo marking, dotted quarter note = 63. As explained in Chapter 4 two hexachords are formed from the wide scale. The hexachord

provides an interval-class vector listing the specific number of common tones in a particular interval class, informing the composer of common tones between a set of intervals and its transposed set. This is called *transpositional invariance*: any given combination of intervals provides the same shape when transposed to another key allowing the wide scales to remain intact by interval.[32] Due to the invariance of intervals and common tones between characters Lindberg is able to overlap the chaconne figure among characters.

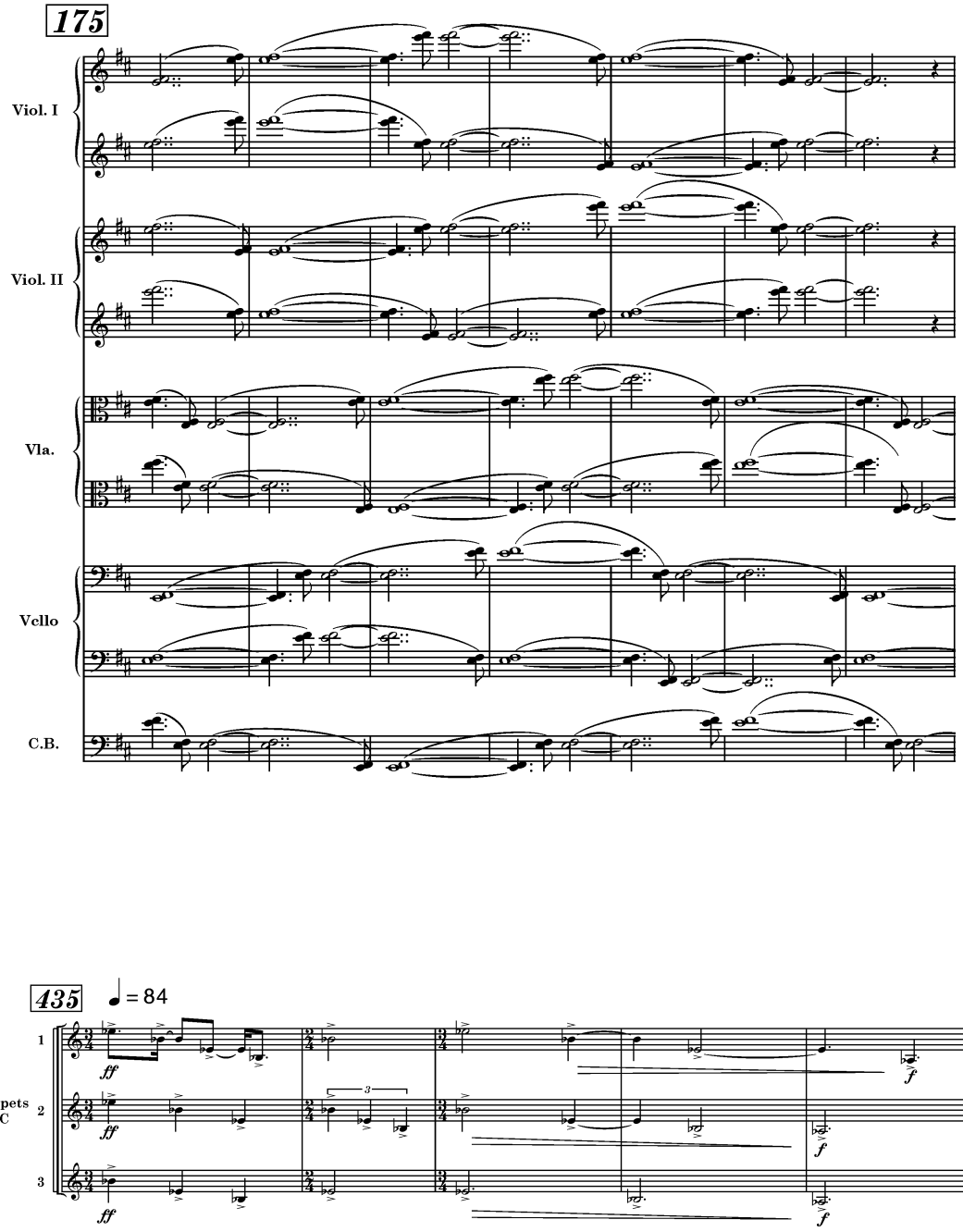
In Character B rhythmic ideas from the sketch are organized in a 5/4 meter, specifically marked as a grouping of 3+2. Character B consistently appears in the score with a tempo of quarter note = 84. It is curious that Character B occurs in three and a half locations throughout the score. The amount of Character B appearances is less than half when compared to the appearances of its fellow characters. Furthermore, this information leads to an assumption that Character B fills the role of a mediator during the conversation, especially since it is found during the opening movement and appears during the final thirty-five measures of the composition.

[32] Douglas Keislar, 1988, Center for Computer Research in Music and Acoustics, "History and Principles of Microtonal Keyboard Design," https://ccrma.stanford.edu/STANM/stanms/stanm45/stanm45.pdf (accessed July 1, 2013).

Sketch material also reveals that harmonies in Character B develop from borrowed harmonies in Sibelius' *Tapiola* (1926). Lindberg lists the interval-class vector as <225222> for Character B. The association between Character B and Sibelius is most visible in the final movement, m. 435 of *Gran Duo*, as described by theorist and author Risto Nieminen.[33]

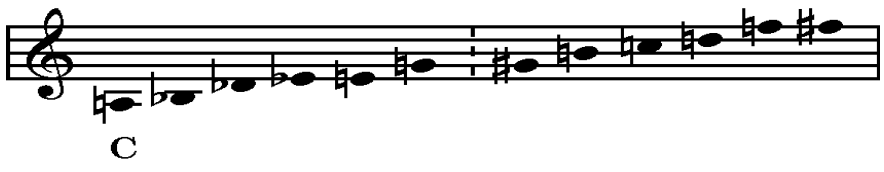
[33] Risto Nieminen, 2000, FIMC "Magnus Lindberg Gran Duo," http://www.fimic.fi/fimic/fimic.nsf/WWOR/E931BCC17567DB17C22575370027A731?opendocument (accessed March 28, 2013).

Example 5.3: Sibelius *Tapiola*, mm. 175-181, Allegro moderato. *Gran Duo*, mm. 435-438. Pitch content from *Tapiola* influencing the final section of *Gran Duo*.



Character C, recurring twice as often as Character B, does not follow or subscribe to the same rhythmic or harmonic pattern that can be found with other characters in *Gran Duo*. Lindberg adds a curious word, "colours" [sic], to rhythm and pitch content in Character C. This word has important implications for the repeated occurrences of Character C. In terms of contrast and texture, *colours* is Lindberg's prompt for changing timbres during the repetition of Character C to develop and expand the conversation. It is interesting to see the development of rhythm in Character C and how it affects the length in measures of this section. Furthermore the realization that this is the first character to not recycle rhythmic ideas makes it one of the more difficult characters to track. In order to identify this character three elements are present, the tempo of quarter note = 126, interval-class vector <224223>, and the wide scale for Character C as illustrated in Example 5.4.

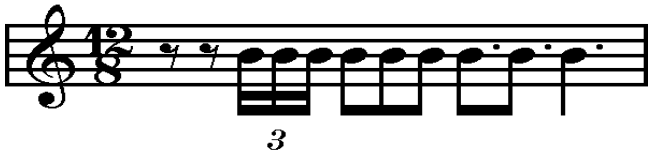
Example 5.4: *Gran Duo*. Character C, *wide scale*.



Following Character C, changes in tempo and rhythm create two transitional character areas: Transition I and

Transition II. Example 5.5 displays the rhythmic idea in place during the transition. Due to the elongation of rhythm this figure is perceived as a slowing of the tempo, however Lindberg only elongates the rhythmic idea. Tempo control comes from the rhythmic design and not through the use of tempo markings.

Example 5.5: *Gran Duo*. Transition I and II rhythmic figure as listed in Lindberg's sketch material.



Transition I and II are used five times throughout the first movement and once during the second movement. The remaining three movements will not see the return of the two transition characters to the conversation. Lindberg uses the Transition I and II characters as a method for offsetting new sections. In Movement I, Section IV begins and ends with Transition I. Section V begins with Transition I followed by Character F which is then succeeded by Transition II and followed by Character E. This sandwich approach to the layering of Transition I and II characters, like toast in a club sandwich, becomes the material needed to offset the conversation held during

Sections IV and V. Lindberg offsets these conversations with Transition I and II to bring focus to a new conversation at the table. The transition characters help to redirect the audience from the conversation like a sidebar. The transition characters will not be seen again until Section X. As a point of interest, the length of Section X contains almost half the amount of measures found in Section V, making the offset of this conversation more like a sidebar to the overall conversation structure.

Lindberg's sketch does not indicate a direction for which character should follow the transitions, however Character F is found to be a common character paired with the transition characters in Movement I, Section V and Movement II, Section X. The conductor uses this evidence to recognize returning character material found in Movement II, Section X as a follow up conversation to Movement I, Section V. The connections made between Sections V and X create a character relationship between the first and second movement. The discovery of this relationship allows the conductor to better follow the character flow of the conversation during the transition.

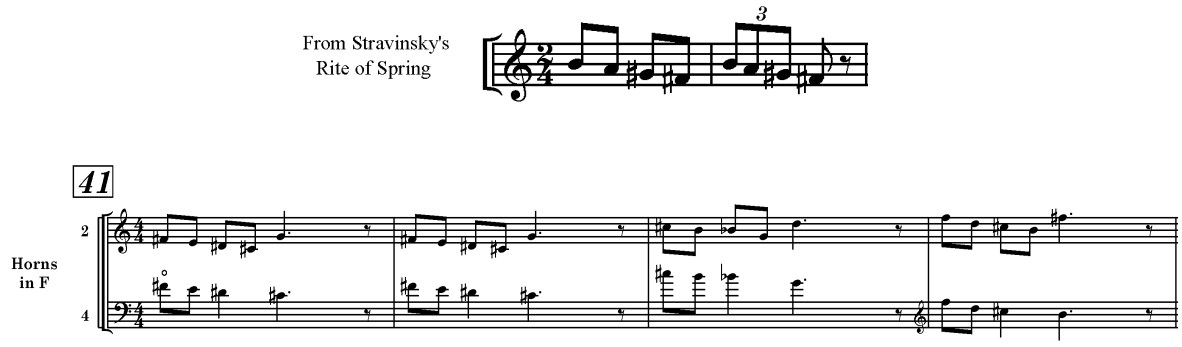
To this point each character has a connection to a wide scale. However, it is curious that two of the transition characters do not list specific wide scales or

interval-class vectors on Lindberg's sketches. In an effort to find a wide scale association with the transition characters, an examination of the sketch material leads to an analysis of how the two transition characters are used during the conversation. The placement of each transition on the tempo chart makes a case that these transition characters are inversions of each other; a variable of inversion has not been discovered between previous characters. Appropriately labeling these transitions helps to offset the main character material and allows Lindberg to use these transitions as "chameleons" of harmonic material to maintain and follow the chaconne pattern.

The overview of characters continues with Character D. Lindberg quotes rhythmic ideas from Debussy's *La Mer* (1903-1905) and applies familiar duple and triple rhythmic material without creating a new palate of rhythm for the character. The tempo marking in Character D, quarter note = 144, provides assurance to the location of Character D during its return in the conversation. As well as familiar rhythmic ideas, a small quotation of melodic material from Stravinsky's *Rite of Spring* (1913) is marked in the character area sketch, Example 5.6. Lindberg uses

interval-class vector <223432> as the pitch material in Character D.

Example 5.6: Stravinsky, *Rite of Spring*. Quote from Lindberg's sketch materials. *Gran Duo*, mm. 41-44. Showing the area in the music that closely represents the quoted pitch material from *Rite of Spring*.



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Lindberg skillfully connects pitch, rhythm, and character traits to create harmonic, rhythmic, and melodic familiarity for each character appearance in the conversation. The term *leitmotiv*, a guiding motive that contains short melodic or harmonic ideas, can be used to explain Lindberg's approach not only to pitch, but also to tempo during the repeat of character areas.[34]

Up to this point in *Gran Duo* each character area is brief and repeats in a manner that imitates the action of re-entering a conversation. Due to the bright tempo and

[34] William Drabkin, *New Grove Dictionary of Music* vol. 12 (London: Oxford University Press, 2005).

brevity of some character areas the audience will not have enough time to become familiar with each of the characters. Understanding these limitations, Lindberg creates character familiarity through pitch, rhythm, and tempo. Remarkably, it is Lindberg's intent to leave the audience in a state of perplexity with the connection to any melodic idea. Lindberg does not intend for the audience to craft their own musical expectations based on the return of the melodic, harmonic, or rhythmic ideas. By not creating a return to a familiar idea, Lindberg is able to accurately depict the nature of a conversation: organic, continually developing, and non-repetitive. This idea is further explained by Peter Szendy's interview, in which Lindberg briefly describes his appreciation for Wagner's ability to fuse character development through rhythm, harmony, and melody:

> Wagner has become very important for me. His work is a model of fusion of all the parameters of musical discourse—rhythm, harmony, melody… —within a perpetual evolution. Music is an art of dramatic expression. I have nothing against narrative music… The way in which Witold Lutoslawski manages to personify thematic work into true characters, almost like in a play is extraordinary. I like a work to have a direction, a development, an evolution between the beginning and the end. My concepts are comparable—but not identical—to those of tonal thought: I think of music in terms of tensions, or relationships of suspension—or even of suspense—and I think it is a shame that we have forgotten everything which gave tonal music its richness, in favor of static structures which are more concerned with

> isolated moments, isolated instants. A lot of pieces are written today which are no more than the investigation of one idea. If you work with oppositions, with contrasted ideas, you are accused of classicism, because of their proximity to the bi-thematic thinking of the sonata. As for me, I willingly own up to this sort of classicism, if that means accepting tensions and a narrative character as components of writing.[35]

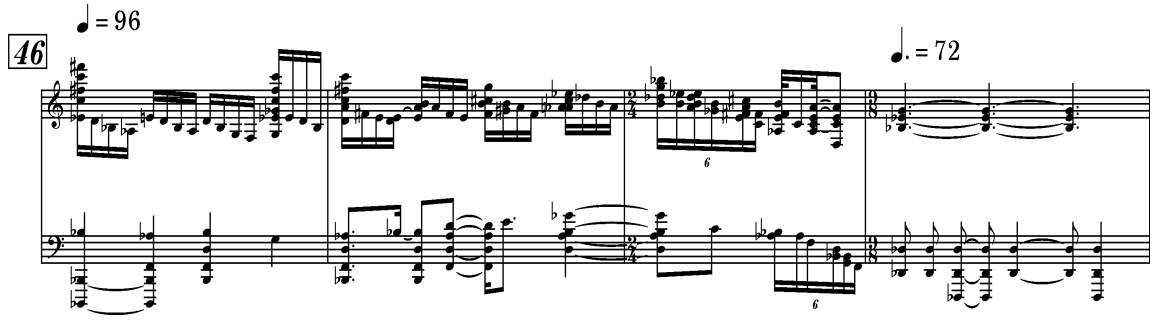
Lindberg describes his philosophy on form as an important compositional element needed to approach thematic ideas—or in the case of *Gran Duo,* the character traits. The material Lindberg uses to identify each of the characters will not provide the same aural familiarity as would leitmotivs of Wagner, Strauss, or Berg. After further inspection of the score, Lindberg is not fully subscribing to the traditional definition or application of the leitmotiv. A move from tradition is not a concern due to Lindberg's compositionally progressive style that supports a connection to past compositional devices, quoting the great composers, while using modern compositional methods like the computer to provide an array of compositional options. Lindberg does not wish to draw the listener into the music by creating familiar appeal for each theme and its continual development. A melodic or harmonic familiarity, on a conscious level, is not the

[35] Magnus Lindberg, interview by Peter Szendy trans. Nick le Quesne (Les Cahierd de l'Ircam, Compositeurs d'aujord'hui, Centre Georges - Pompidou, 1993), 12-13.

characteristic to attribute with his music. Lindberg's musical connection and fascination with the subconscious mind allows him to explore a new current of musical creativity. In *Gran Duo* connecting the eight character areas in the woodwinds and brass during the conversation provides a heightened level of interest for his audience. [36]

Character E, labeled as "Patterns" in the sketch material, reflects the consistent flow of sixteenth notes. Example 5.7 illustrates the rhythmic patterns attributed to Character E.

Example 5.7: *Gran Duo*, mm. 46-49. Rhythmic patterns from Character E, including the sextuplets, m. 48, for transition entering Character F, m. 49.



Gran Duo by Magnus Lindberg
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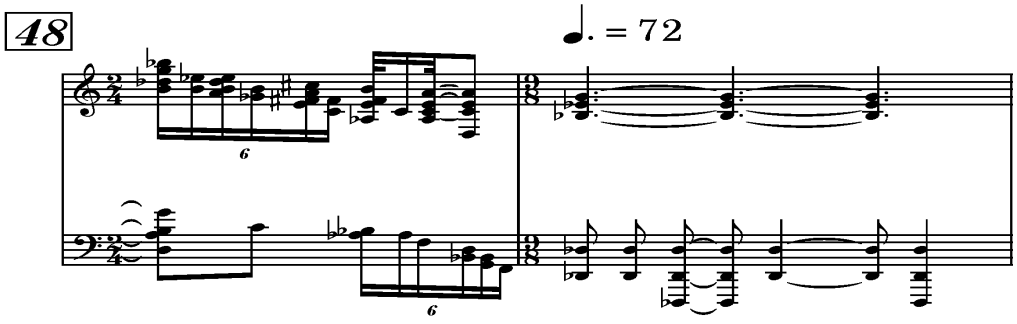
The sextuplet rhythmic pattern in m. 48 provides a stable subdivision during the transition. Prior to Character F tension was created through a triplet sixteenth rhythmic figure, but now the triplet serves as

[36] Ibid., 14.

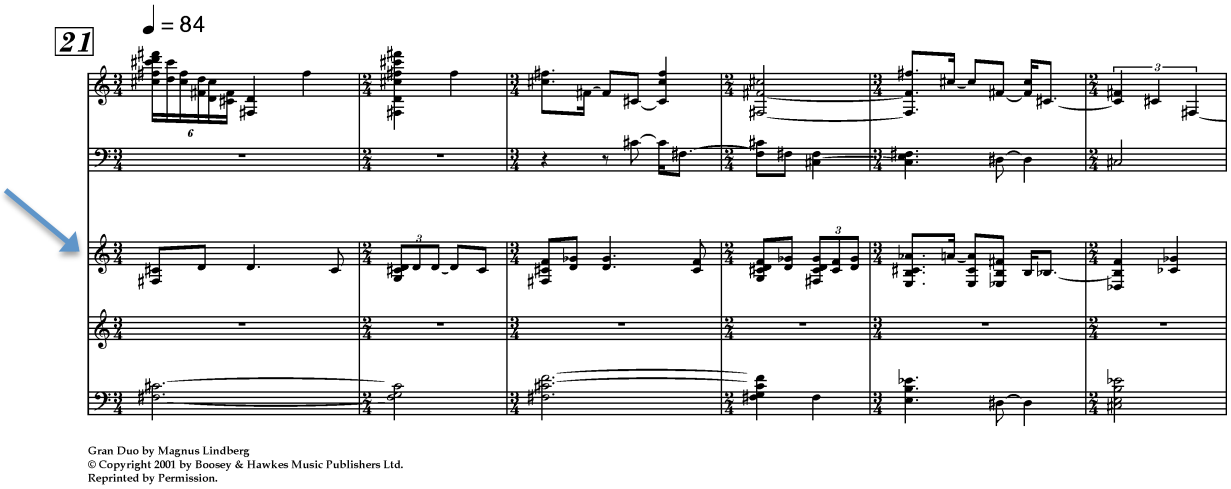
an agent for the release of tension. Releasing tension by means of a specific rhythmic idea is observed in Example 5.8, mm. 48-49.

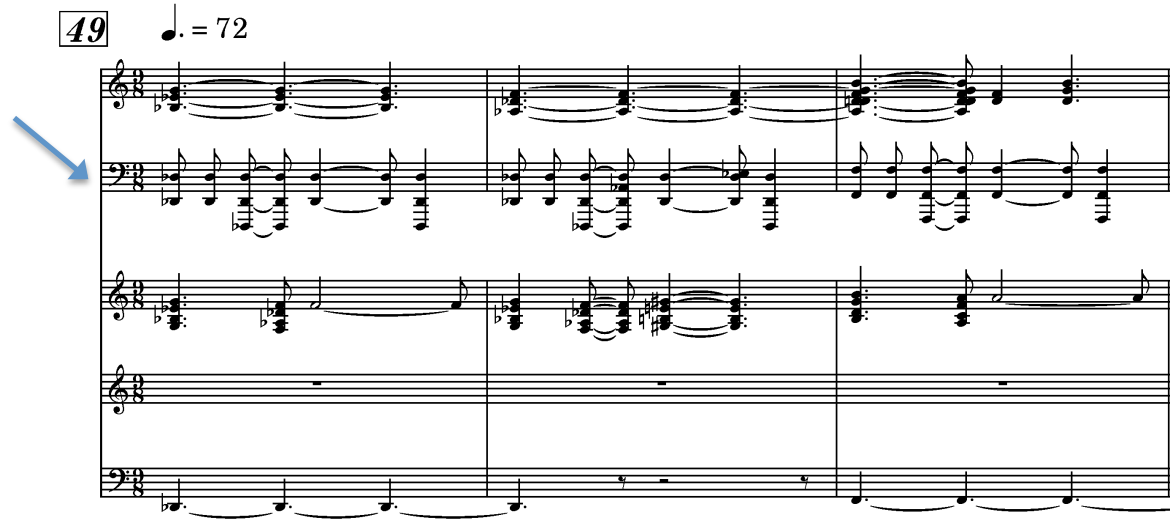
Example 5.8: *Gran Duo*, mm. 48-49. The triplet pulse as a rhythmic element becomes the catalyst for the change in tempo.



Character F, like other characters, is identified by tempo, dotted quarter note = 72. A change in meter from duple to triple reduces the previously increased tension. Adding an extra eighth note to the pulse, from 4/4 meter to 9/8 meter, elongates the character's rhythmic structure. Rhythmic similarities in Character B and F, Example 5.9, reveal a shared rhythmic relationship between the triple rhythms found in both characters.

Example 5.9: *Gran Duo,* Character B, mm. 21-26; Character F, mm. 49-51. The rhythmic relationship of the triplet found in duple and triple meter in Characters B and F.





CHARACTER DEVELOPMENT

Character areas continually develop throughout the composition, reflecting the nature and flow found in conversation. As each character joins the conversation a

level of conversational etiquette is observed. Lindberg is careful not to overlap character areas. At times characters will interject comments but never will one character cover up another character. Lindberg organizes the material in a way that allows the conversation to develop organically. The organic nature of this conversation makes locating recurring character material difficult due to the ever-changing landscape of the conversation. This organic nature is an opportunity for an alternative structural analysis by spectral graphs to assist the conductor with understanding formal structure, thus the complete spectral graph located in Appendix C.

Tempo and rhythm, two elements studied during score analysis, are substantial in the search of character area material particularly for locating subsequent characters in the conversation. The need to identify subsequent characters brings the conductor to an analysis of how tension and release relate to and influence character tempos. After organizing and graphing each character tempo, patterns appear that explain the relationship between the flow of tension and release during the character's return. For example, out of the nineteen sections Section I and II repeat the tempo pattern. Following the transition in Section IV, Character C, D, E,

and F lead towards a double transition. This pattern reflects the growth and decay of tension in the brass and woodwind conversation. The decay of tension is just enough to advance the conversation, but never pushing the envelope too far so as to keep the characters from arguing. An interesting pattern during Section VI shows an increase of tempo at the rate of one third and the decrease of tempo at the same rate between Characters D and E. This information provides closure to signify the end of Movement I due to the back and forth banter between characters. The banter is suggestive of a conversation with polite exchange while the formalities of closure signify the end to the movement. However, at this point the conversation is still young. The climax of the work's tension is still 150 measures after the end of Movement I.

A traditional labeling of the structural form becomes challenging due to the frequent changes in tempo between the eight different character areas of this twenty-minute work. It becomes important to associate specific rhythmic, melodic, and harmonic elements with each character. *Through composed* is an accurate description of this composition's structural form. In the first movement the consistent ordering of character areas forms harmonic and tempo patterns. The information found in the tempo graph

in Appendix B also provides a visual representation of the formal structure from a tempo aspect. An additional benefit of the character tempo graph is to provide a map for the conductor to assist with the memorization of tempi.

In each section of the five movements three musical elements consistently assist with the evaluation of form: tempo, rhythm, and melody. These elements develop rhythmic, melodic, and harmonic [the chaconne] motives in each character area. Percy Scholes from *The Oxford Companion to Music* states that musical form is "a series of strategies designed to find a successful mean between the opposite extremes of unrelieved repetition and unrelieved alteration."[37] Lindberg creatively selects the character areas as a foundation for the structural form of *Gran Duo*.

The organic development allows Lindberg to challenge the audience's ears and engage the conscious and subconscious mind through the development of each character. This explains why the intuitive ear identifies melodic and harmonic characters due to their familiar intervallic relationship. However, the brevity of the

[37] Percy A. Scholes, "Form." *The Oxford Companion to Music,* 4th ed. (Oxford: Oxford University Press, 2004) 261-262.

musical connection allows characters to become quickly lost by the conscious mind. Lindberg states during interviews that he does not wish for the audience to be aware of the composition's form; understanding the composition's structure is not the focus of his artistry. Lindberg wishes the music to create an acoustic experience to transform the way in which an audience receives a performance of his music.[38] Music is not always an experience that tells a story, creates a picture of euphoria or depression, or illustrates a link between natural phenomena and human behavior. Lindberg has said that he does not "consciously establish cryptic links between natural phenomena and human behavior" but he has found musical inspiration in architecture's balance and space. His works are developed around a sense of action, situation, or signification. [39] However, Lindberg's music is not preplanned to signify an event in natural phenomena or human behavior.

To summarize, identifying each of the eight character areas during their evolution provides information leading to the formal design of this continuous multi-movement work. Lindberg's tempo markings attached to each character

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[38] Tim Howell, *After Sibelius: Studies in Finnish Music* (Burlington, VT: Ashgate Publishing Company, 2006), 240.

[39] Szendy, 7.

act as signposts to assist with the identification of character areas. The means of graphing each character by tempo becomes a tool that gives the conductor an overview of the tempo relationships between each of the eight character areas.

Material from Lindberg's sketches assists with the understanding of the design and development of the eight character areas. The influence of individual character areas by rhythmic, melodic, and harmonic elements working together provides a continually developing conversation throughout the twenty-minute work. The formal structure surfaces after discovering a link between the texture, timbre, and rhythm as they work together to create constantly changing character traits. Although the form is not traditionally defined, each of the character traits provides enough information to allow Lindberg's composition to musically replicate a conversation between woodwinds and brass.

CHAPTER 6: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS FOR FURTHER STUDY

SUMMARY

Over the last fourteen years since the 2000 world premiere, ninety-seven documented performances of *Gran Duo* by Magnus Lindberg have occurred, of those, six have been university wind bands (three American and three European institutions)[40]. The small percentage of performances from university wind bands is surprising given that the community of university wind conductors typically embraces new music. Perhaps the small number of performances is due to the composition's new challenges for conductors and the university wind band.

The first challenge a conductor faces during score study is the daunting task of understanding the work's complex form. *Gran Duo* follows no previously established formal template from which to relate, but rather follows an organic design. The organic design allows change to occur in each of the eight character areas, mimicking the conversation-like banter between the brass and woodwinds.

The next challenge is the requirement of a highly skilled ensemble, capable of meeting the demands of intricate chamber-like passages in the twenty-minute work.

[40] Listed by Boosey and Hawkes Lindberg's publisher, web search performed June 5, 2013.

Complex rhythmic entrances and exposed areas throughout the work require advanced soloist technique and rhythmic timing often at the hocket-like subdivision of four notes per pulse. Yet another challenge in the university setting is Lindberg's omission of saxophone, euphonium, and percussion in the orchestration. However, the absence of these regular instruments of the wind ensemble also provides a creative challenge for programming chamber music utilizing these combinations of instruments to accompany programming of Lindberg's *Gran Duo* for twenty-four winds.

A formal analysis of *Gran Duo* requires an examination that would prove difficult for one even with an advanced theoretical background. Consequently, this document focuses on elements to help the conductor in organizing the eight character areas and five movements. The spectral graphs used as a supplemental score study tool provide a visual representation of how texture, timbre, and rhythm emphasize character areas, transitional areas, and structural form. A conductor will then be able to transfer information from the graphs to a rehearsal setting, helping the ensemble understand the intricacies of returning character material.

Rhythmic and harmonic elements found in the composer's sketches provide guidance for the conductor when analyzing structural and formal events. Material from Marcus Castrén's analysis on pitch organization provides detailed information leading to a better understanding of Lindberg's harmonic language and construction of the wide scale. The wide scales provide pitch material for each of the eight character areas, further contributing to a deeper understanding of how Lindberg's pitch material is used in the development of each character.

Tempo graphs illustrate patterns of repeated character material. This data assists the conductor when making choices about articulation, dynamic contrast, and balance. Metronome indications serve as primary markings to define character areas. The tempo graphs in Appendix B organize the fifty-one tempo changes throughout the twenty-minute work allowing the conductor to examine the pattern of tempo relationships between character areas. The tempo relationships in the graph reveal the contour of the architectural design, which divide the work into five movements.

Tempo markings further define character areas and are used to influence the flow of conversation. For example, Characters D and E act as the lead roles of the

conversation, while Characters A, C, and F provide support as secondary roles. Character B is curiously quiet, almost observing the conversation like a mediator. During the last twelve measures of the composition Character B appears again to signal the end of the conversation. The appearance of Character B does not provide certainty or closure to the conversation, but only signifies that the time for this conversation has expired.

The document reveals that texture, timbre, and rhythm work collectively to identify the composition's structural elements. Spectral graphs in Appendix C provide evidence that these elements become significant factors with locating the eight character areas. In Chapter 5 tension and release reveal that when applied judiciously these two elements assist with the location of character change during the conversations. Additionally each spectral graph analysis of texture and timbre visually illustrates high and low areas of tension and release. Overall, spectral graphs create a supplemental score study tool to aid the interpretation and realization of Lindberg's musical intent.

The composer states that "Duo" in the title refers to a conversation between the woodwinds and brass. However, after analyzing the form and becoming familiar with the

structure of each character it is apparent that “Duo” describes a duel between thoughts and ideas—the transformation of thought during a conversation. “Gran” is used as a reference for the scope of the conversation implying that the work’s overall structure is a large form. However, the five continuous movements do not follow a traditional formal structure. Because the work is organic, meaning that the character areas are developed and transformed from their original statement, Lindberg develops each of the character areas to mimic the course of a conversation. Consequently, the constant change of melodic and phrasal structure prevents each appearance from becoming a literal restatement of the initial character material.

Additionally, the nature of a conversation dictates a change in thought following a response. The character’s response in each area transforms the conversation organically. An organic nature and the lack of definition of movements delivers a level of difficulty in locating structural form without first understanding each character’s traits.

CONCLUSIONS

Gran Duo resides in the wind band genre as a unique work of art utilizing unfamiliar compositional techniques to most wind band conductors. Lindberg labels his work as post-serial, neotonal, and spectral, three labels that are contrasting as well as contradictory in terms of how he chooses to use these techniques.

The construction of wide scales from the harmonic series suggests a serial approach, however Lindberg does not follow through with the fixed order of pitches associated with twelve-tone technique. He adjusts the principals of serialism and acoustics to create an exceptionally rich harmonic language. Neotonal suggests Lindberg's harmonic approach is focused around a tonal center or a central pitch—this can be identified as the chaconne. Lindberg's label as a spectral composition justifies how he has combined serial and electronic music, using the two to create an additional musical genre. The development of spectral music was a move away from the strict and abstract rules of serialism. "Spectral music was moving towards consonance without looking back to the tonal era" providing a level of formalization to

electronic music that had not been attempted.[41] The balance of these three genres and Lindberg's ability to combine each offer him a large palette from which to create new combinations of timbres and textures unique to the wind band.

During the initial analysis Lindberg's influence of computer-assisted composition led to the hypothesis that a spectral analysis of form could reveal structural features of *Gran Duo*. Upon further examination the spectral graphs alone did not provide specific structural details in relation to form due largely to the organic nature of the character material. However, spectral graphs when used as a supplemental tool for score study assist with an alternate view of the character areas and movements. This information can assist the conductor and ensemble with a deeper understanding of individual performer interaction within the ensemble.

Recognizing tempo relationships between characters aids the conductor in organizing the composition's form. Using the tempo chart during score study provides assistance to the conductor in defining the eight character areas, nineteen sections, and five movements.

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[41] Justin Lepany, "Principles and Techniques of Spectral Music," http://justin.ovh.org/docs/JustinLepany_SpectralMusic.pdf, (accessed May 25, 2013).

When approaching style of repeated character material the option for musical interpretation becomes available to the conductor. Due to the organic nature of ebb and flow found in conversation the tempo chart is a visual aid for plotting the landscape and outlining form of the composition.

Lindberg's limited repertoire for the wind band allows *Gran Duo* to become a model of spectral compositional technique for this genre. It is the hope that this research provides information to the wind band community about Lindberg's compositional technique and challenges all conductors to further explore the score. By influencing other composers to explore the wind band as a worthwhile artistic medium, the exploration of new works has propelled the wind band repertoire to an innovative level.

The spectral composer supports an interest in composing with music that is based on the sound itself—the acoustic properties. Using acoustic properties as a foundation to the compositional process offers a wide array of acoustic options from the wind band palette. The artistic degree representing the level at which Lindberg creates *Gran Duo* for winds is best described by Marcus Castrén as "the work of a master craftsman."

RECOMMENDATIONS FOR FURTHER STUDY

Because this document focused on the relationship of texture, timbre, and rhythm in relation to form it would be of interest to see if the use of spectral graph analysis would reveal similar information about form in other compositions. Could a spectral analysis of Stravinksy's *Symphonies of Wind Instruments* or Debussy's *La Mer* lead to alternative score study approaches? Will these two works yield any parallel findings regarding the visualization of structure and form in relation to texture, timbre, and rhythm? Additionally, it would be interesting to examine *Gran Duo* in a Schenkerian analysis to discover additional underlying structural layers. The ability to diagram background, middle ground, and foreground areas would provide an in-depth understanding of structural relationships between character material, harmony, and form.

Finally, Lindberg's interest in Stravinsky's tempo and pitch organization could lead to an exploration of timbre with tempo in *Gran Duo*. Using information from the tempo graphs creates a diagram to organize brass and woodwind timbres in each of the character areas.

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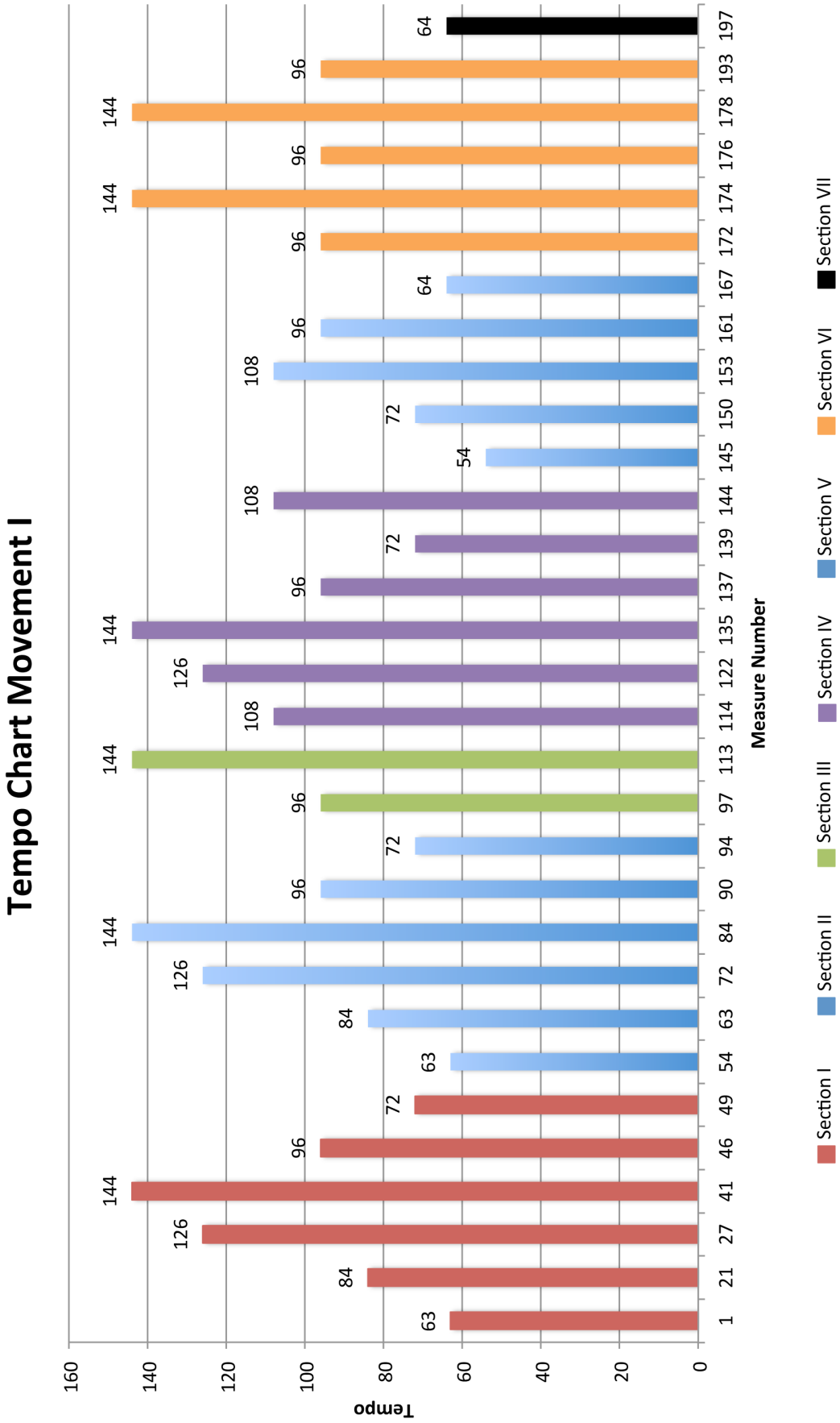
APPENDIX A: GRAN DUO: PROGRAM NOTE FROM THE SCORE

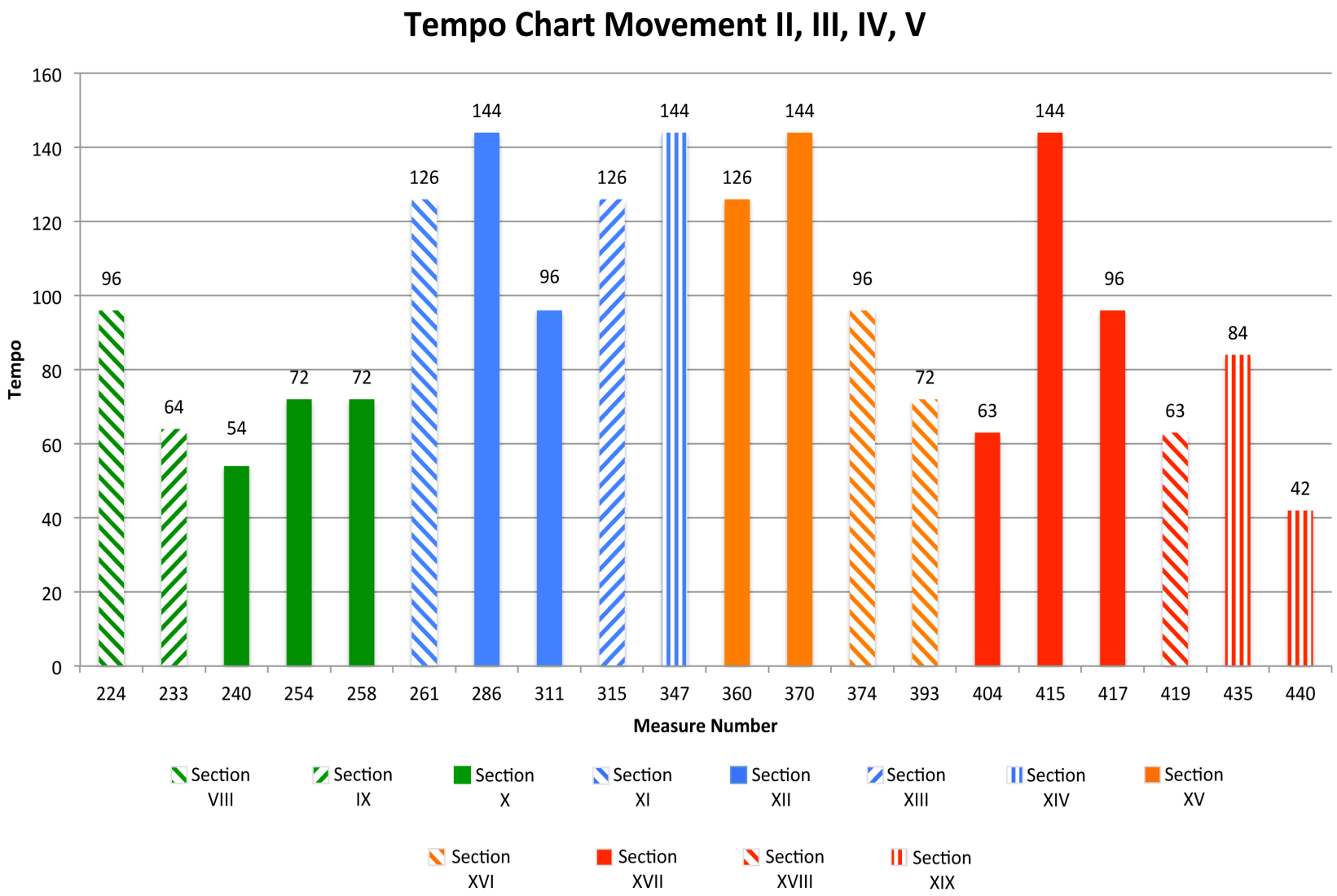
Gran Duo was composed in 1999-2000 and is a dialogue between the two orchestral families of woodwind and brass, each with their respective material. Their initial characters, equating to the poetic stereotypes of 'masculine' and 'feminine', become progressively blurred and androgynised during the course of the composition as larger sound masses give way to chamber music-style sub-groupings and individual instrumental solos.

The wind-only scoring of the work posed various compositional challenges. The composer has stated that 'if no-one is playing, nothing is heard', so the illusion of sustained sound has to be created without the support of a string section. Similarly, clear attack and accentuation have to be carefully sculpted, as there is no percussion to help articulation.

-January 2005

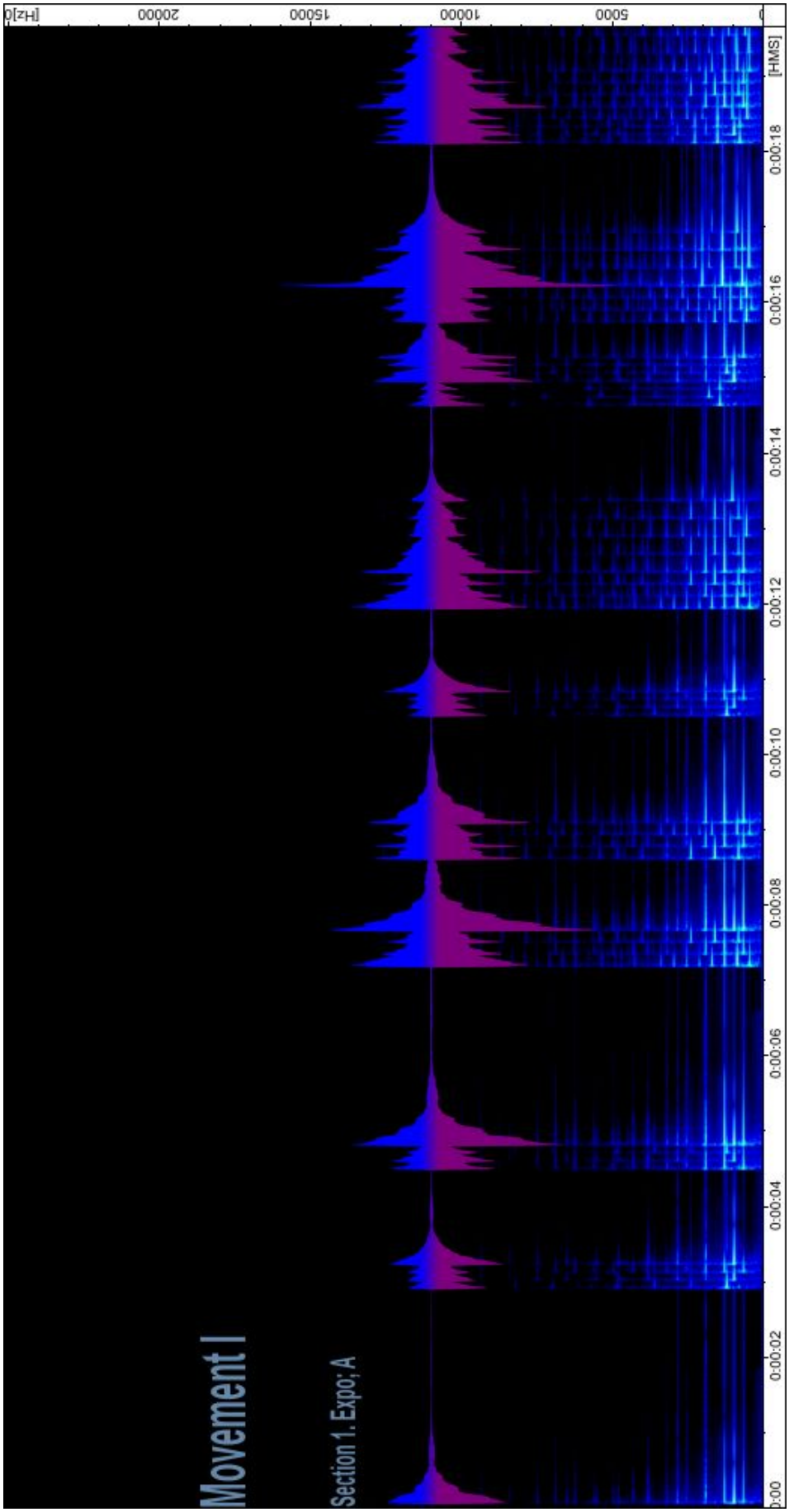
APPENDIX B: TEMPO GRAPHS


Tempo Chart Movement I
Tempo
Measure Number
Section I
Section II
Section III
Section IV
Section V
Section VI
Section VII

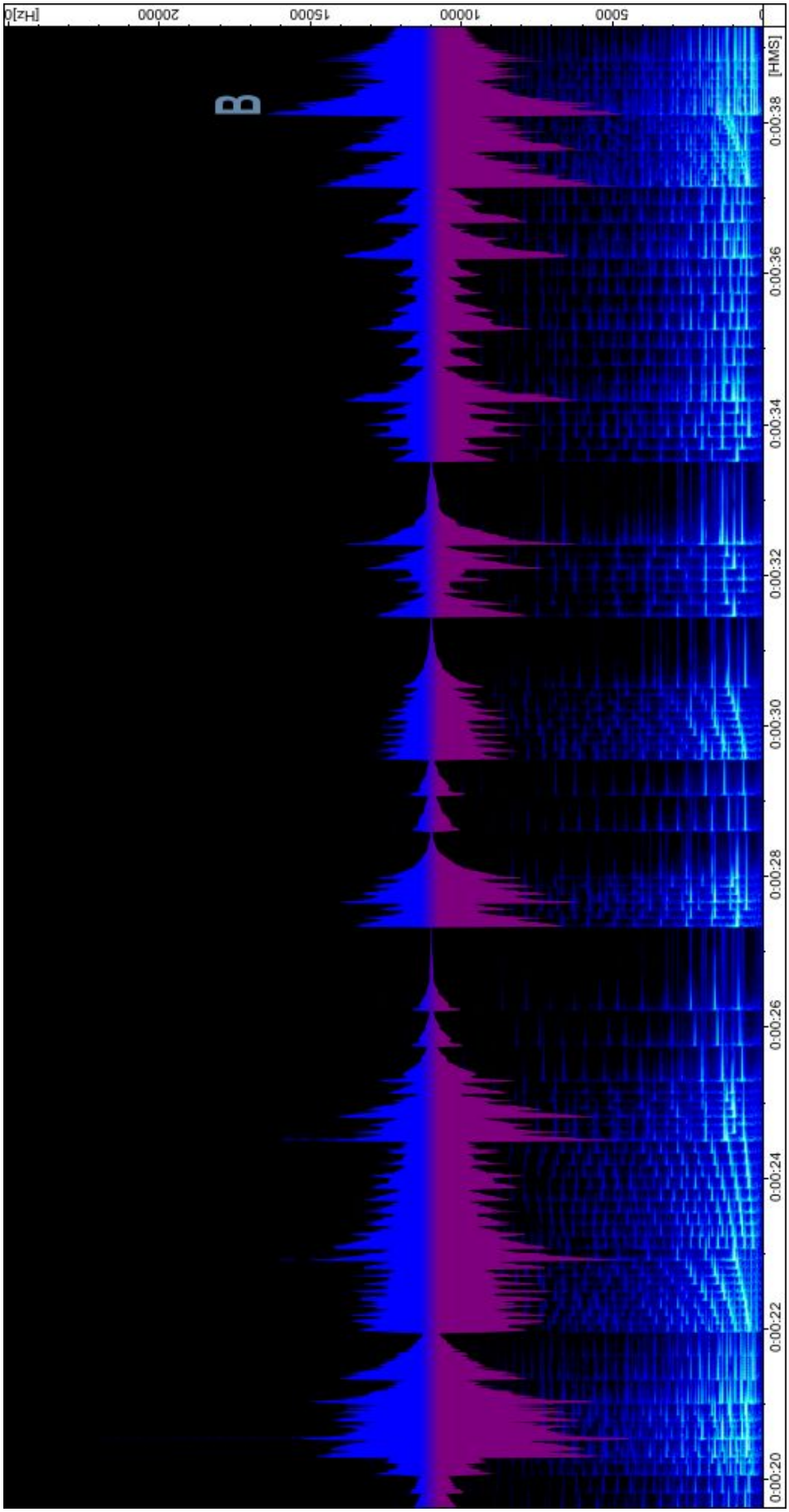

Tempo Chart Movement II, III, IV, V
Tempo
160
140
120
100
80
60
40
20
0
96
64
54
72
72
126
144
96
126
144
126
144
96
72
63
144
96
63
84
42
224
233
240
254
258
261
286
311
315
347
360
370
374
393
404
415
417
419
435
440
Measure Number
Section VIII
Section IX
Section X
Section XI
Section XII
Section XIII
Section XIV
Section XV
Section XVI
Section XVII
Section XVIII
Section XIX

APPENDIX C: SPECTRAL GRAPHS

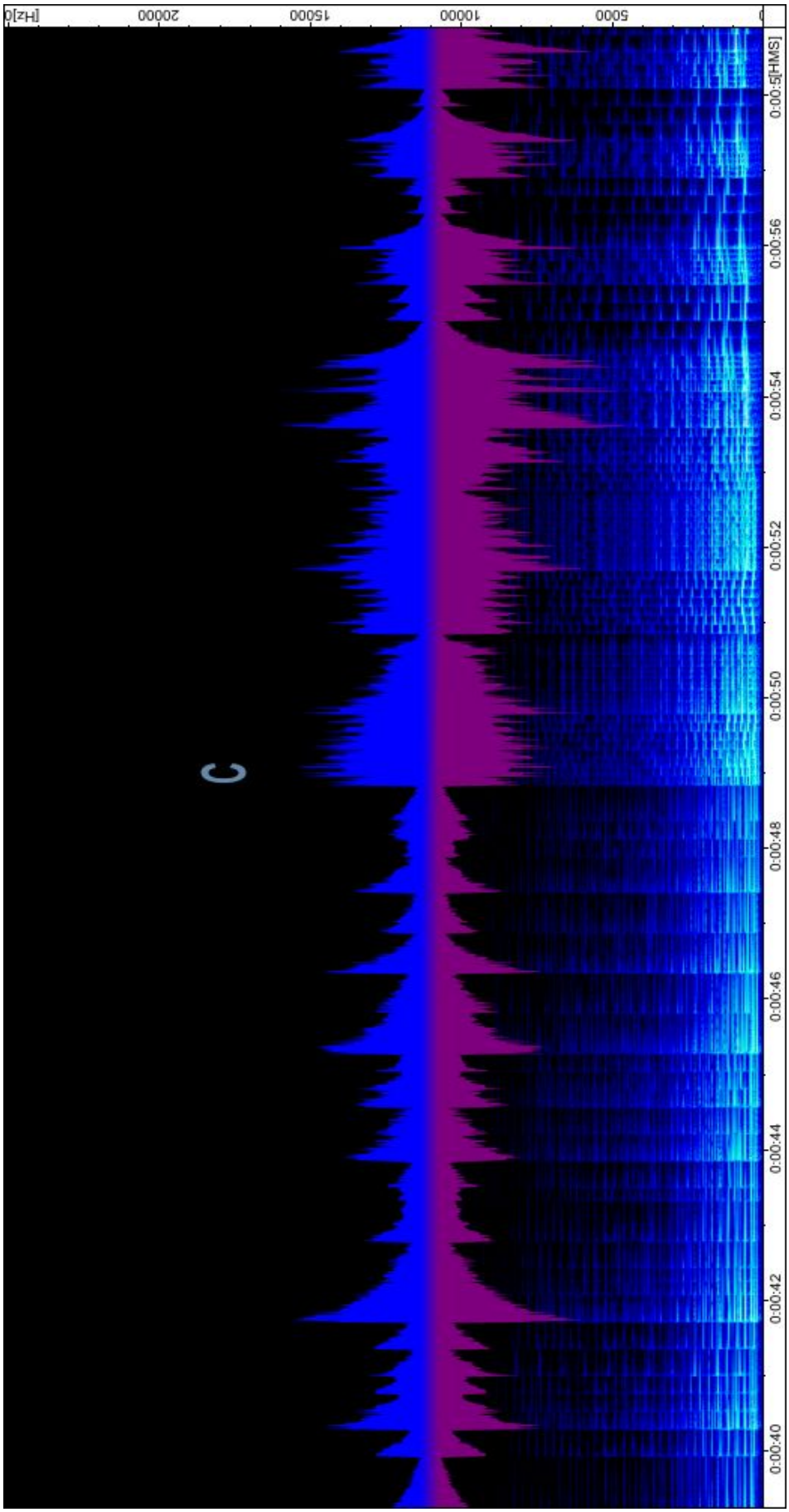
m. 1

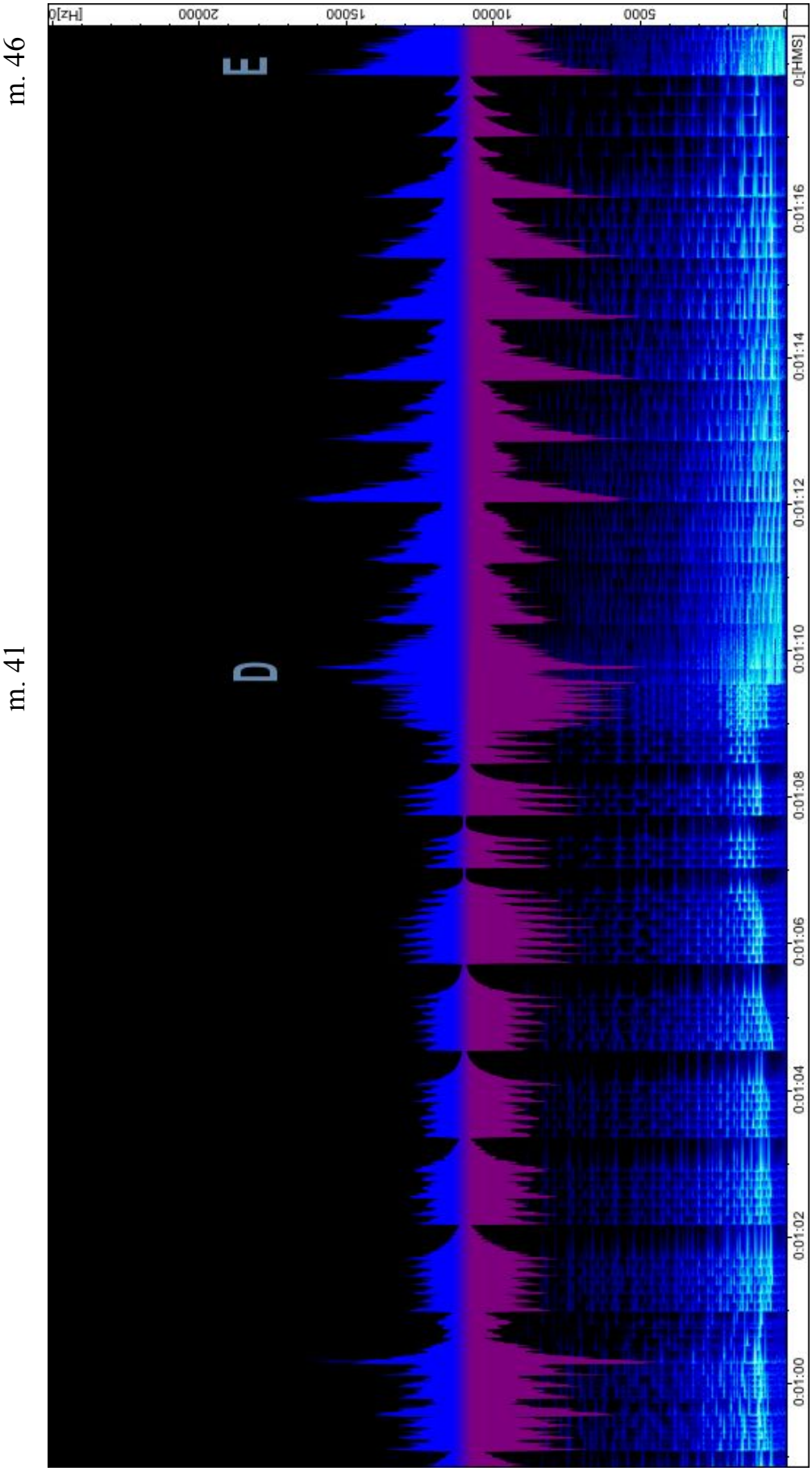

Movement I
Section 1, Expo; A
[Hz]
20000
15000
10000
5000
0
[HMS]
0:00:18
0:00:16
0:00:14
0:00:12
0:00:10
0:00:08
0:00:06
0:00:04
0:00:02
0:00

m. 21

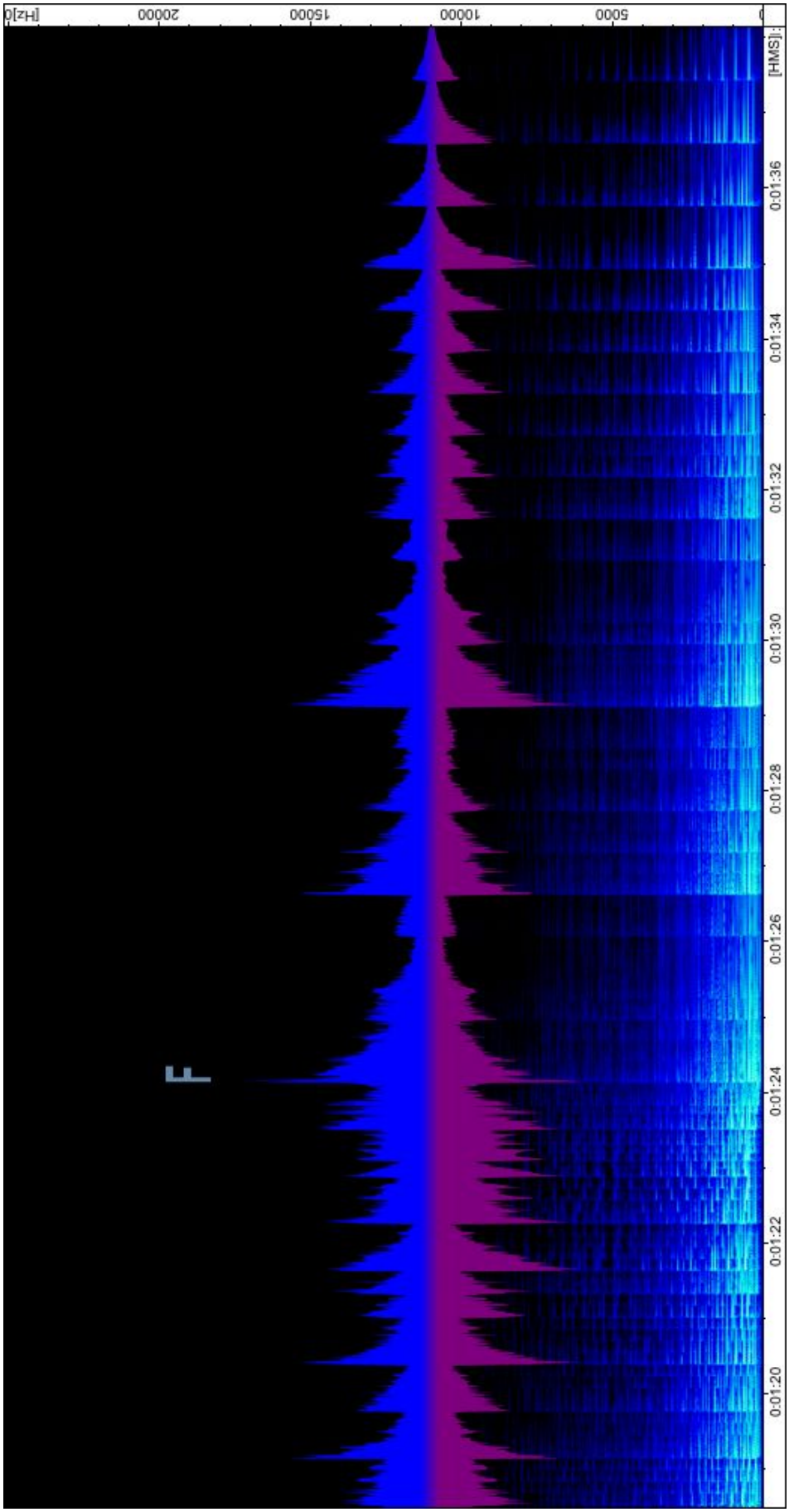

B
[Hz]0
20000
15000
10000
5000
0
[HMS]
0:00:38
0:00:36
0:00:34
0:00:32
0:00:30
0:00:28
0:00:26
0:00:24
0:00:22
0:00:20

m. 27

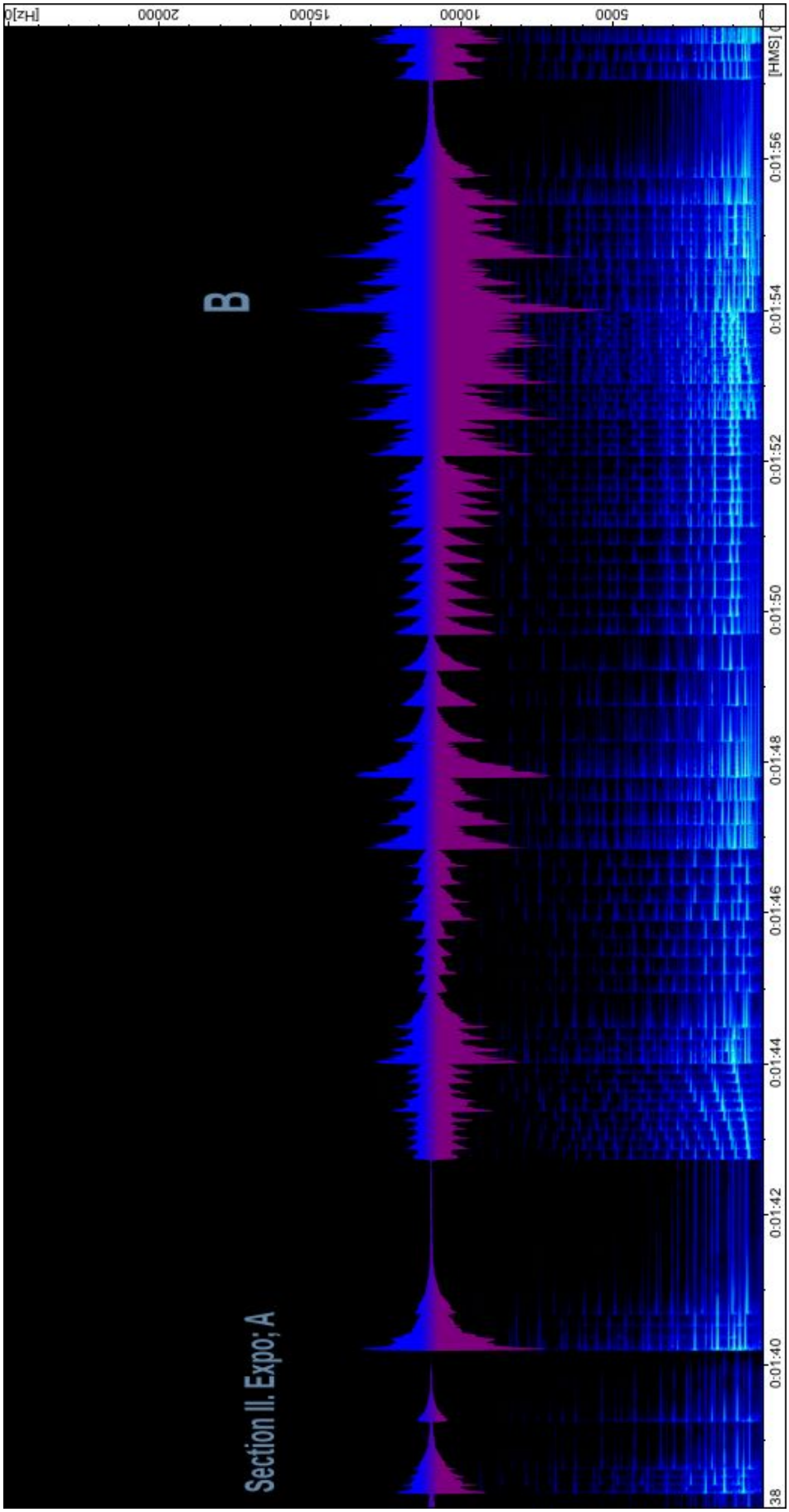

[Hz]0
20000
15000
10000
5000
0
[HMS]0:00:40
0:00:42
0:00:44
0:00:46
0:00:48
0:00:50
0:00:52
0:00:54
0:00:56
0:00:58
C


m. 46
m. 41
D
E
[Hz]0
5000
10000
15000
20000
0:[HMS]
0:01:00
0:01:02
0:01:04
0:01:06
0:01:08
0:01:10
0:01:12
0:01:14
0:01:16

m. 49


[Hz]0
20000
15000
10000
5000
0
[HMS]:
0:01:20
0:01:22
0:01:24
0:01:26
0:01:28
0:01:30
0:01:32
0:01:34
0:01:36
F

m. 54


Section II. Expo; A
B
[Hz]0
5000
10000
15000
20000
38
0:01:40
0:01:42
0:01:44
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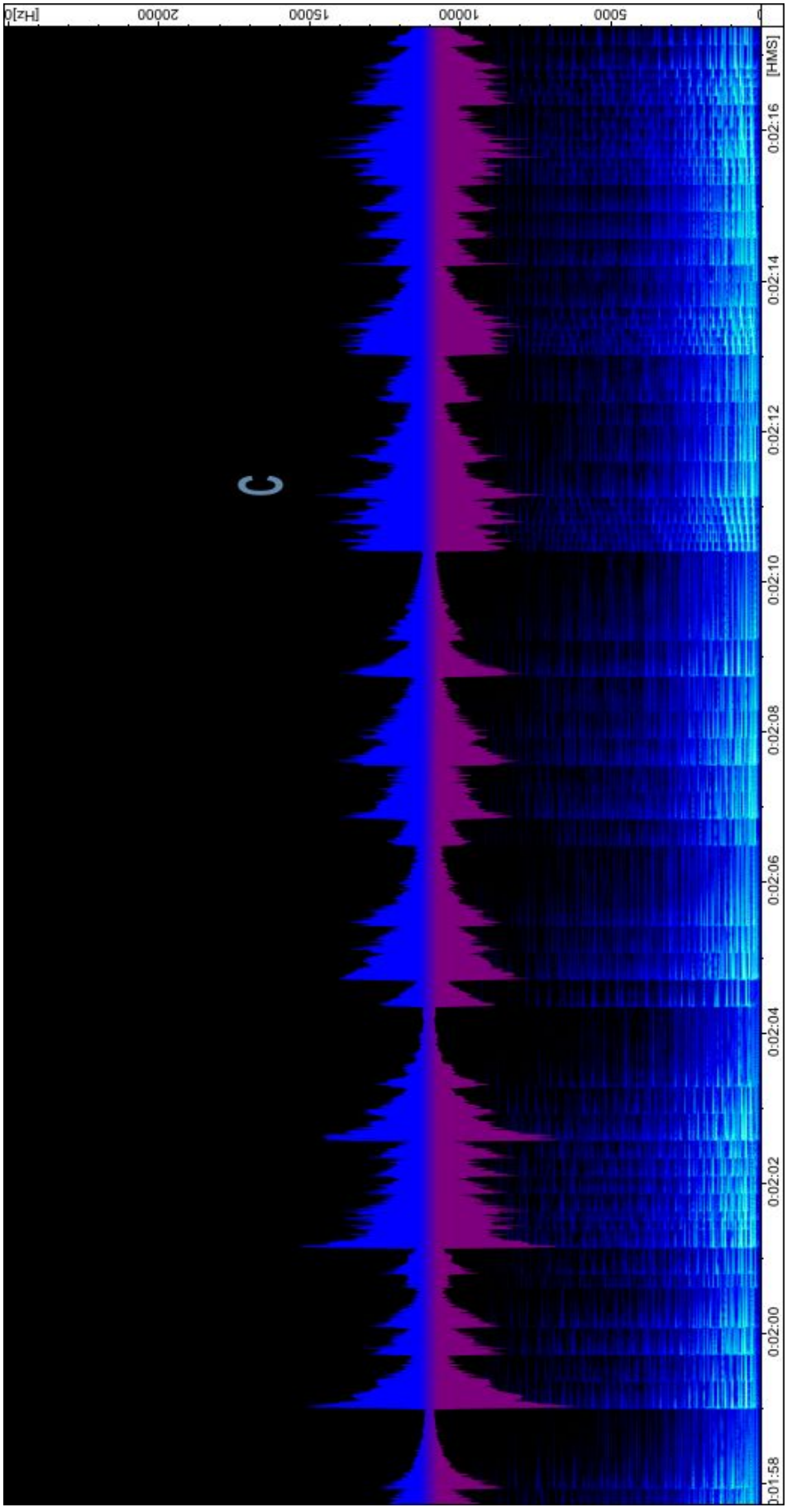
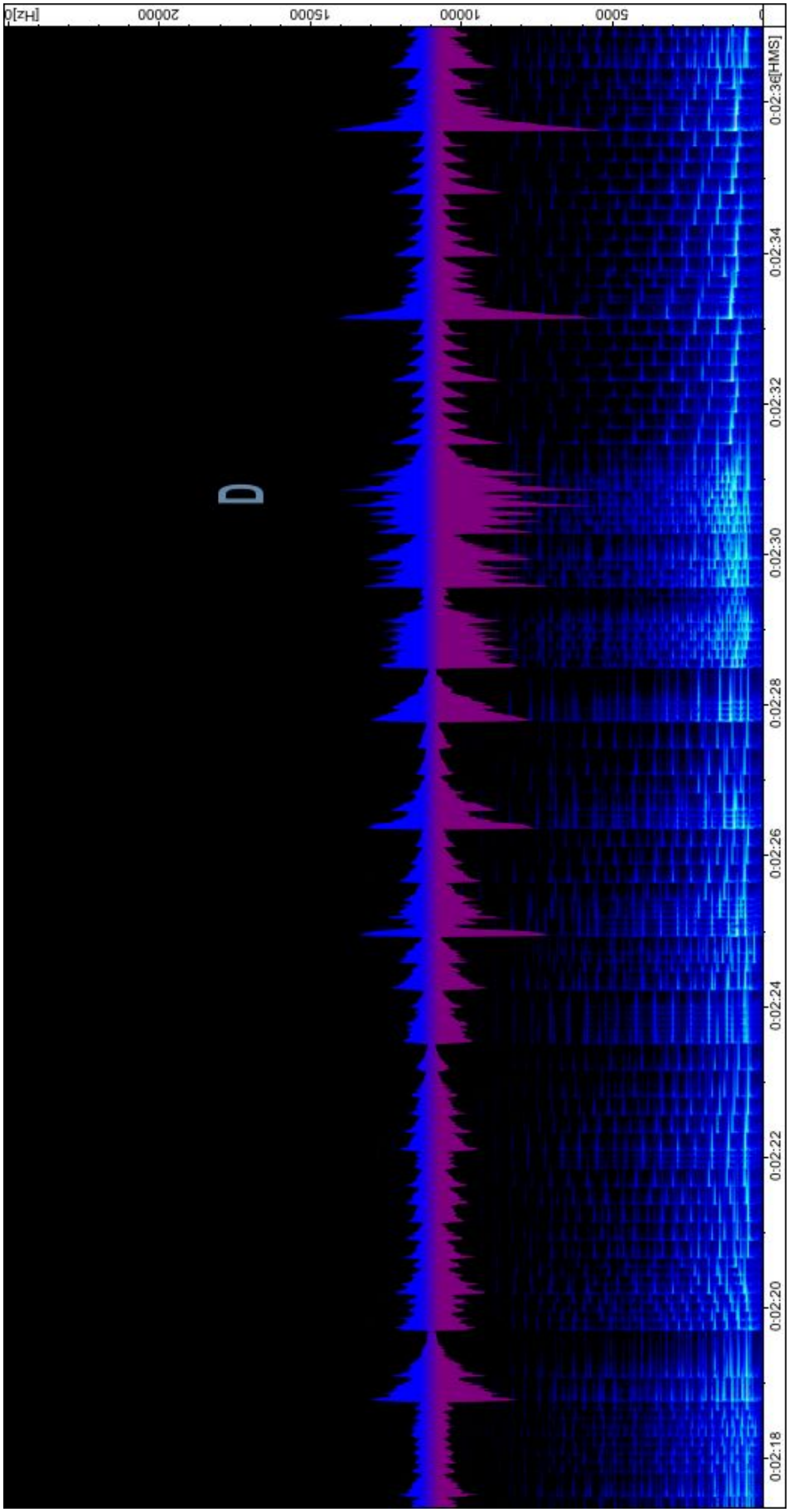
0:01:48
0:01:50
0:01:52
0:01:54
0:01:56
[HMS]

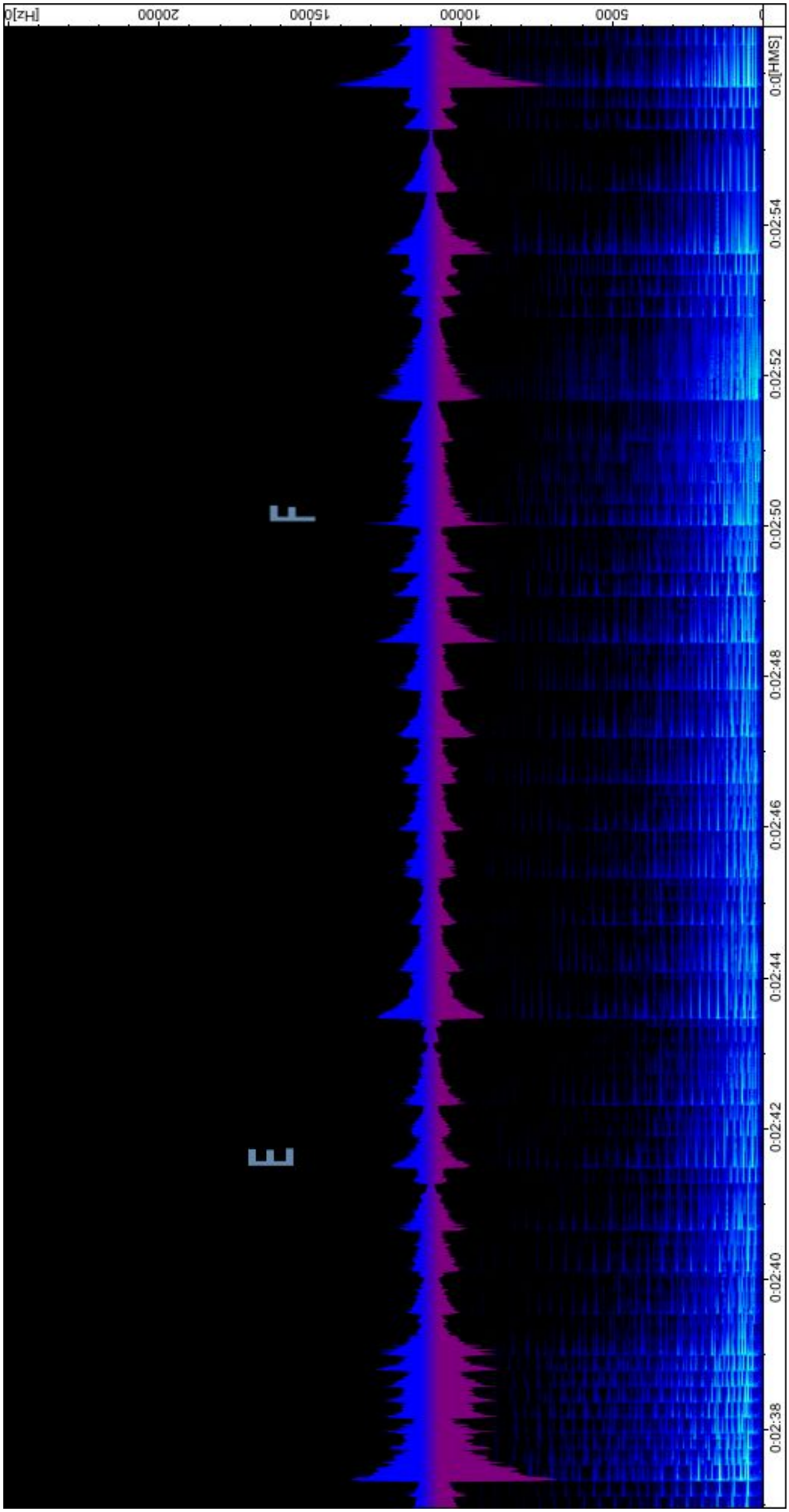
m. 63

m. 72


[Hz]0
20000
15000
10000
5000
0
[HMS]
0:02:16
0:02:14
0:02:12
0:02:10
0:02:08
0:02:06
0:02:04
0:02:02
0:02:00
0:01:58

m. 84

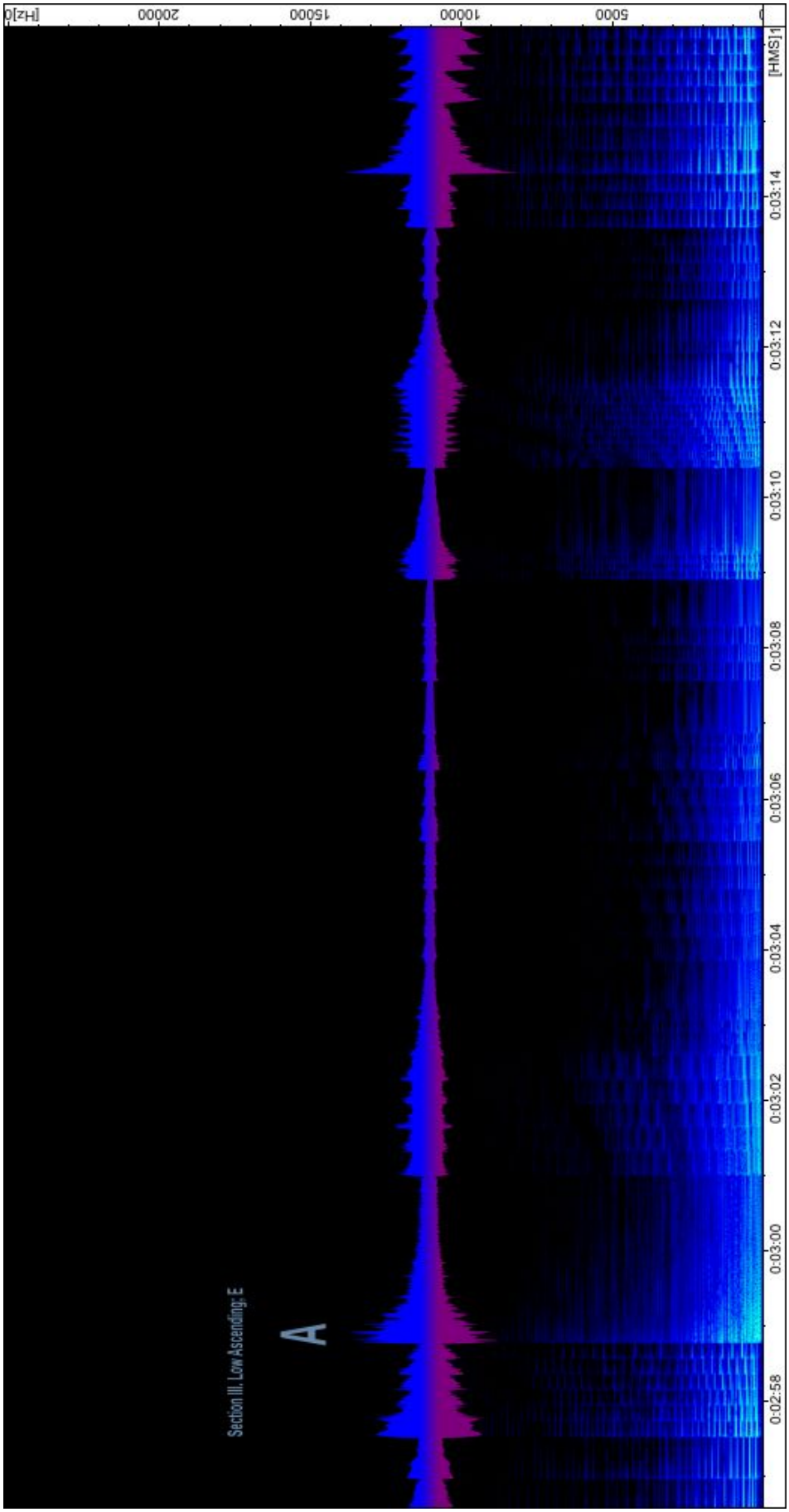

[Hz]0
20000
15000
10000
5000
0
D
0:02:18
0:02:20
0:02:22
0:02:24
0:02:26
0:02:28
0:02:30
0:02:32
0:02:34
0:02:36[HMS]


[Hz]0
20000
15000
10000
5000
0
0:0[HMS]
0:02:54
0:02:52
0:02:50
0:02:48
0:02:46
0:02:44
0:02:42
0:02:40
0:02:38
E
E

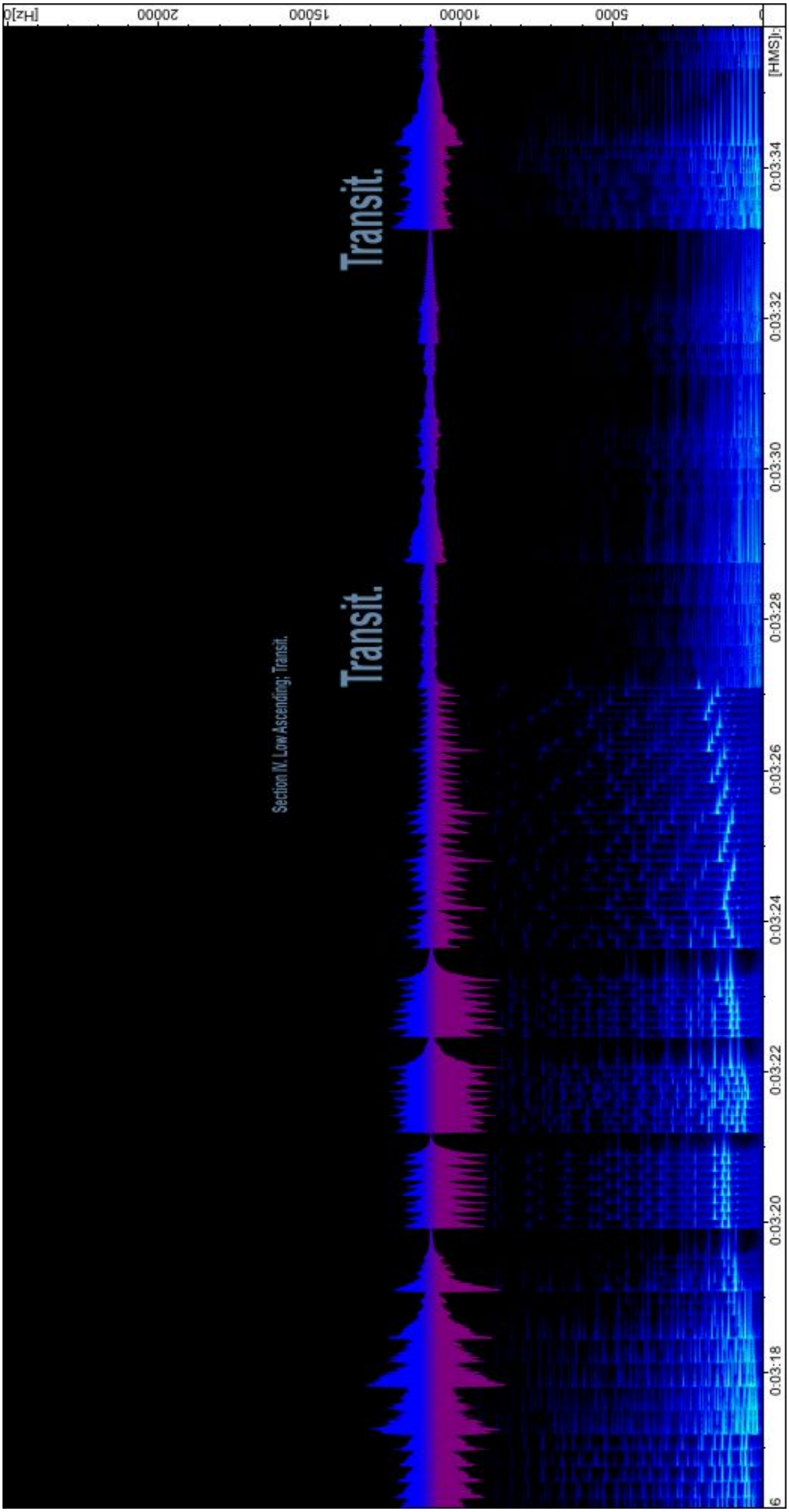
m. 90

m. 94

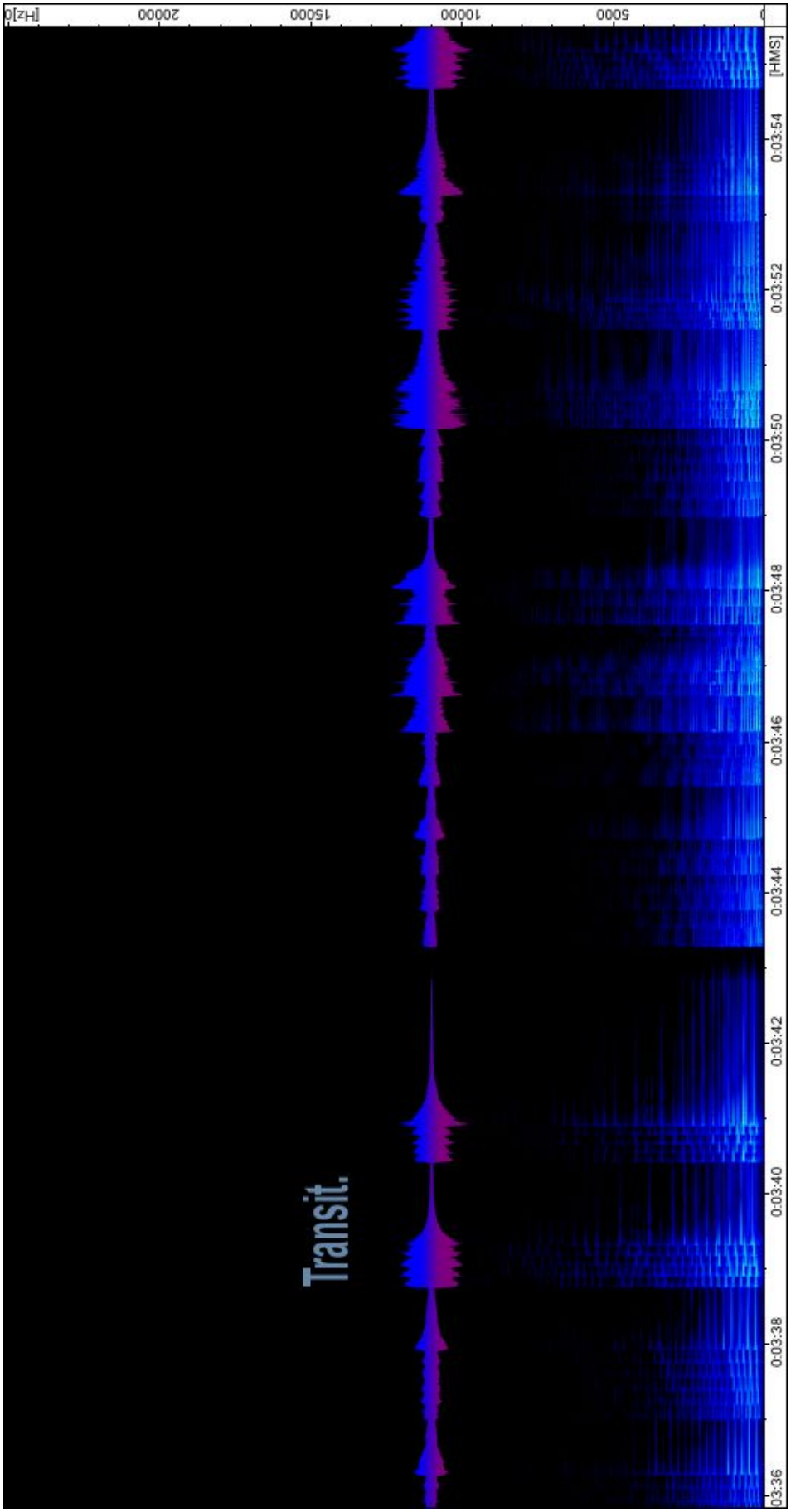
m. 97

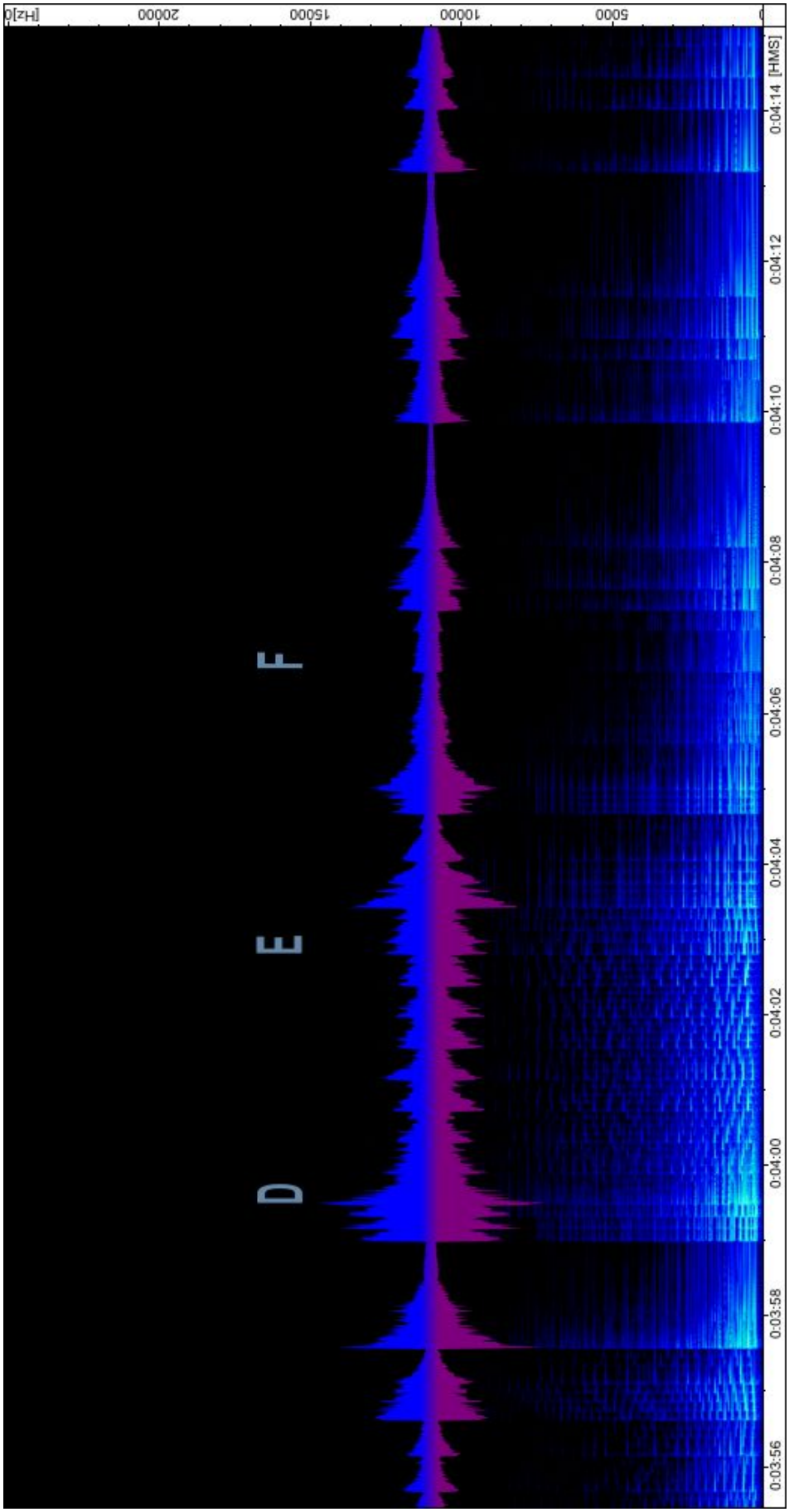

[Hz]0
20000
15000
10000
5000
0
[HMS]1
0:02:58
0:03:00
0:03:02
0:03:04
0:03:06
0:03:08
0:03:10
0:03:12
0:03:14
A
Section III. Low Ascendings: E

m. 114

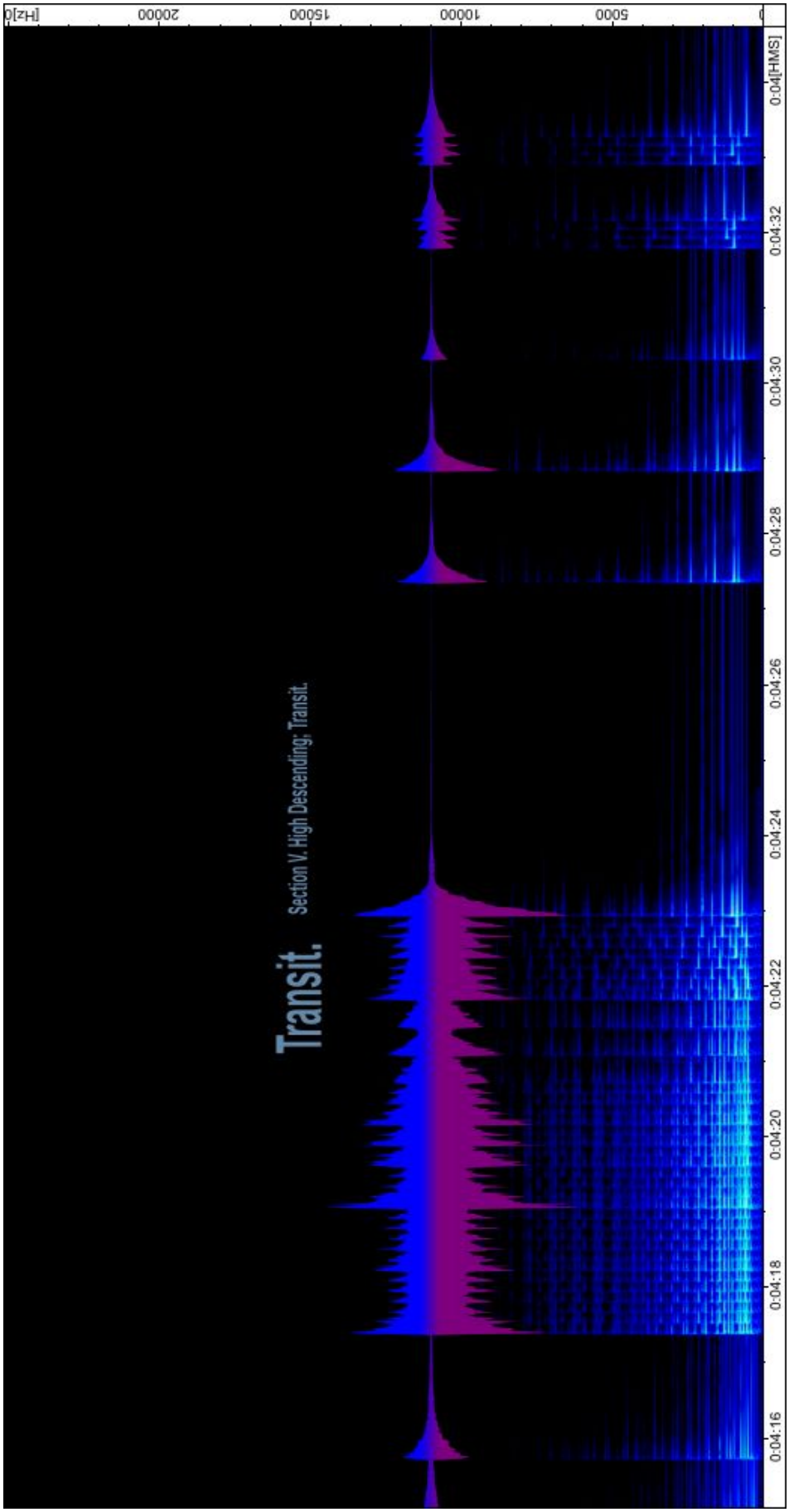

Transit.
Transit.
Section IV. Low Ascending; Transit.
[Hz]
20000
15000
10000
5000
0
[HMS]:
0:03:34
0:03:32
0:03:30
0:03:28
0:03:26
0:03:24
0:03:22
0:03:20
0:03:18
6

m. 122

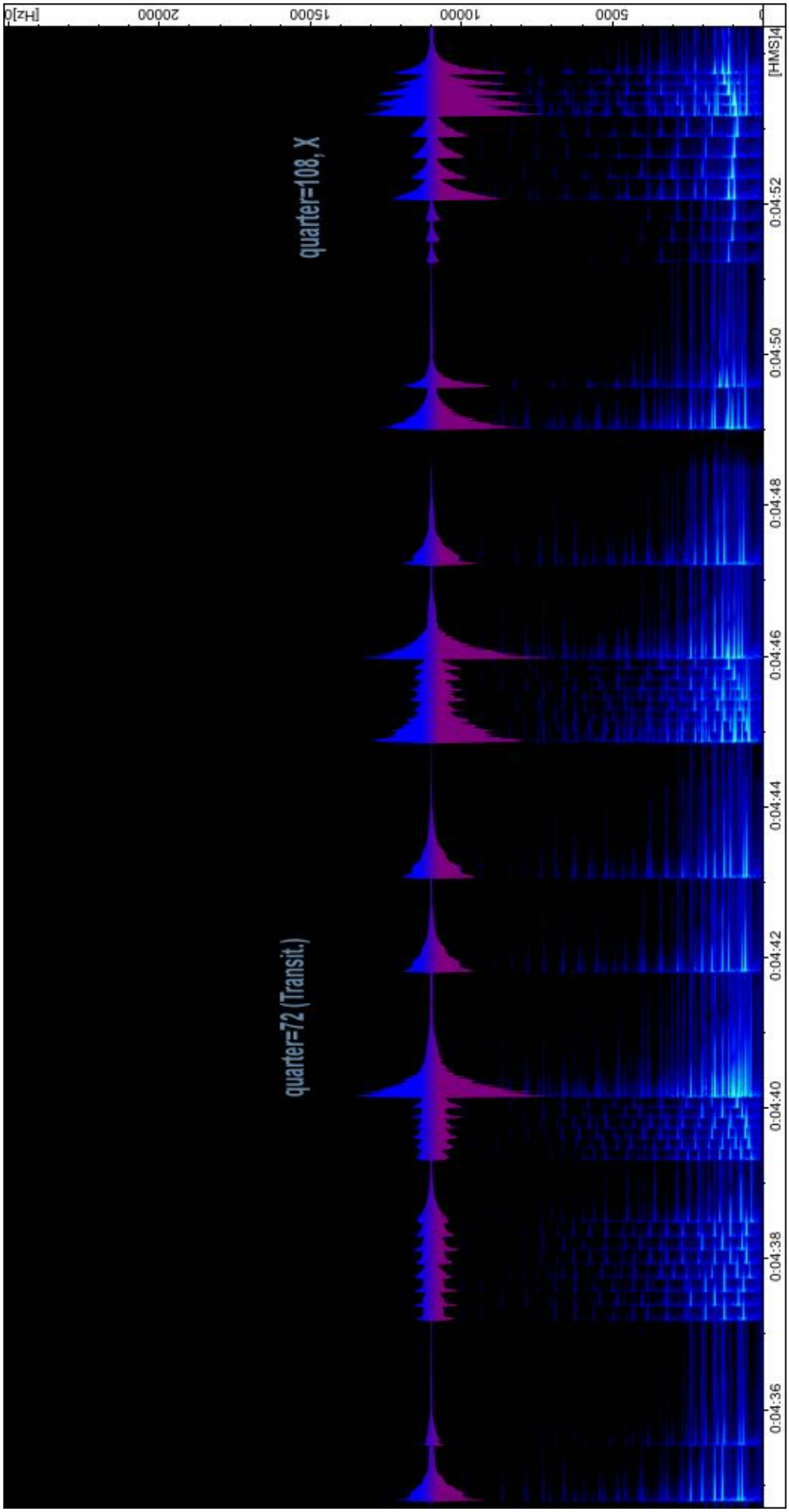

Transit.
[Hz]0
5000
10000
15000
20000
0
[HMS]
0:03:36
0:03:38
0:03:40
0:03:42
0:03:44
0:03:46
0:03:48
0:03:50
0:03:52
0:03:54


m. 135
m. 137
m. 139
D
E
F
[Hz]0
5000
10000
15000
20000
0:03:56
0:03:58
0:04:00
0:04:02
0:04:04
0:04:06
0:04:08
0:04:10
0:04:12
0:04:14 [HMS]

m. 144 m. 145

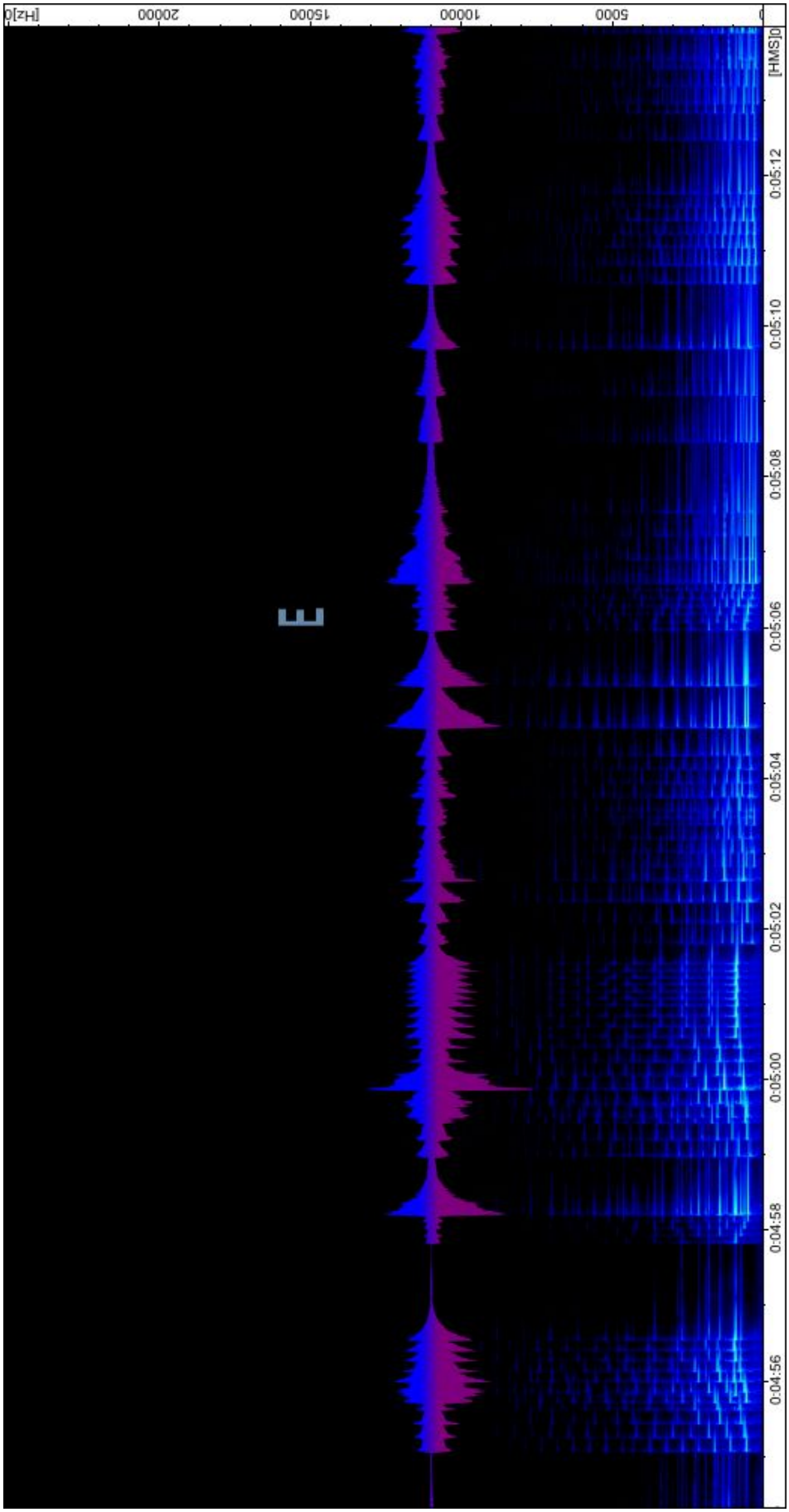

Transit.
Section V. High Descending: Transit.
[Hz]0
20000
15000
10000
5000
0
0:04:16
0:04:18
0:04:20
0:04:22
0:04:24
0:04:26
0:04:28
0:04:30
0:04:32
0:04[HMS]

m. 153

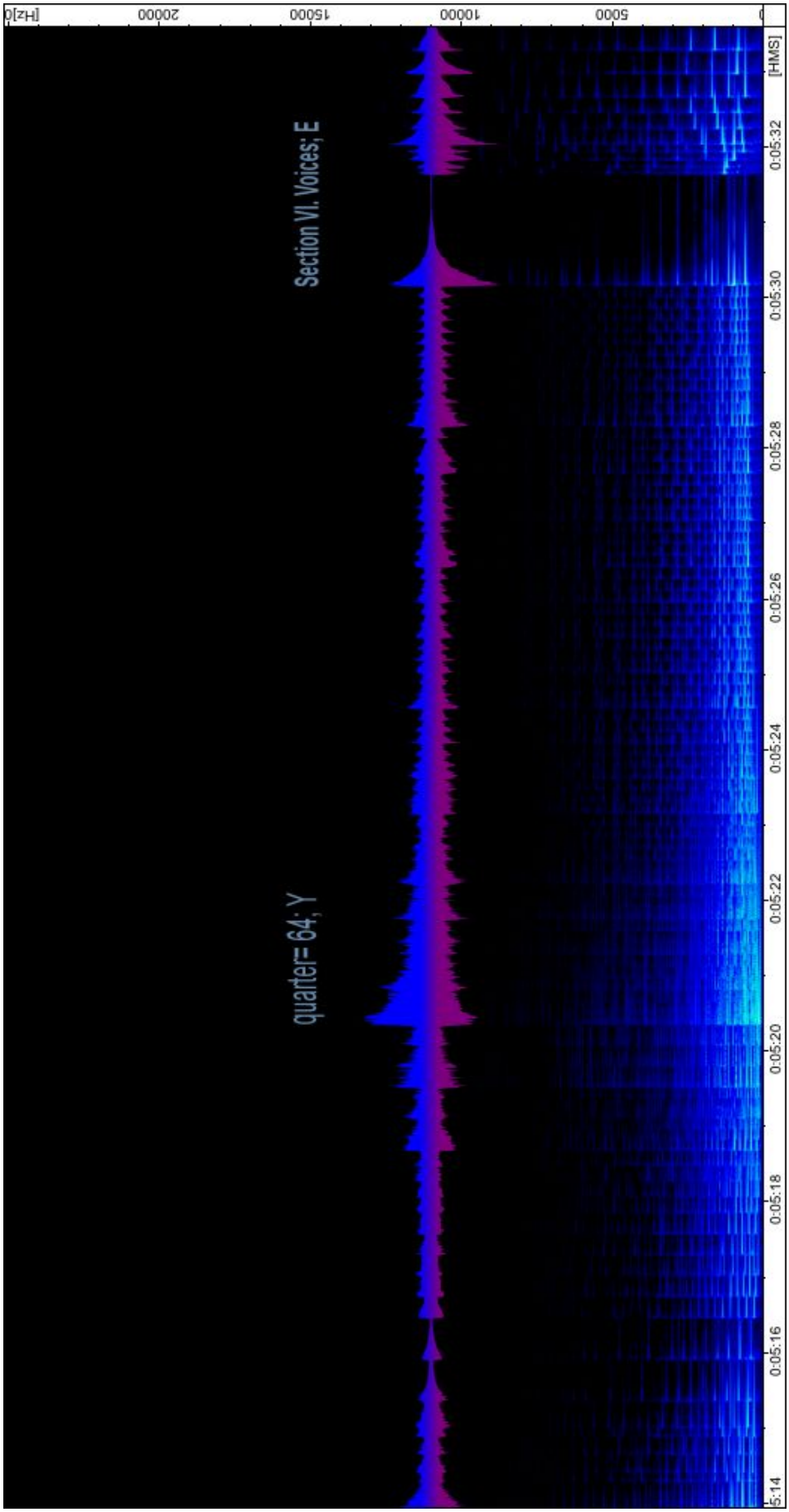

[Hz]0
20000
15000
10000
5000
0
quarter=108, X
quarter=72 (Transit.)
0:04:36
0:04:38
0:04:40
0:04:42
0:04:44
0:04:46
0:04:48
0:04:50
0:04:52
[HMS]4

m. 150

m. 161

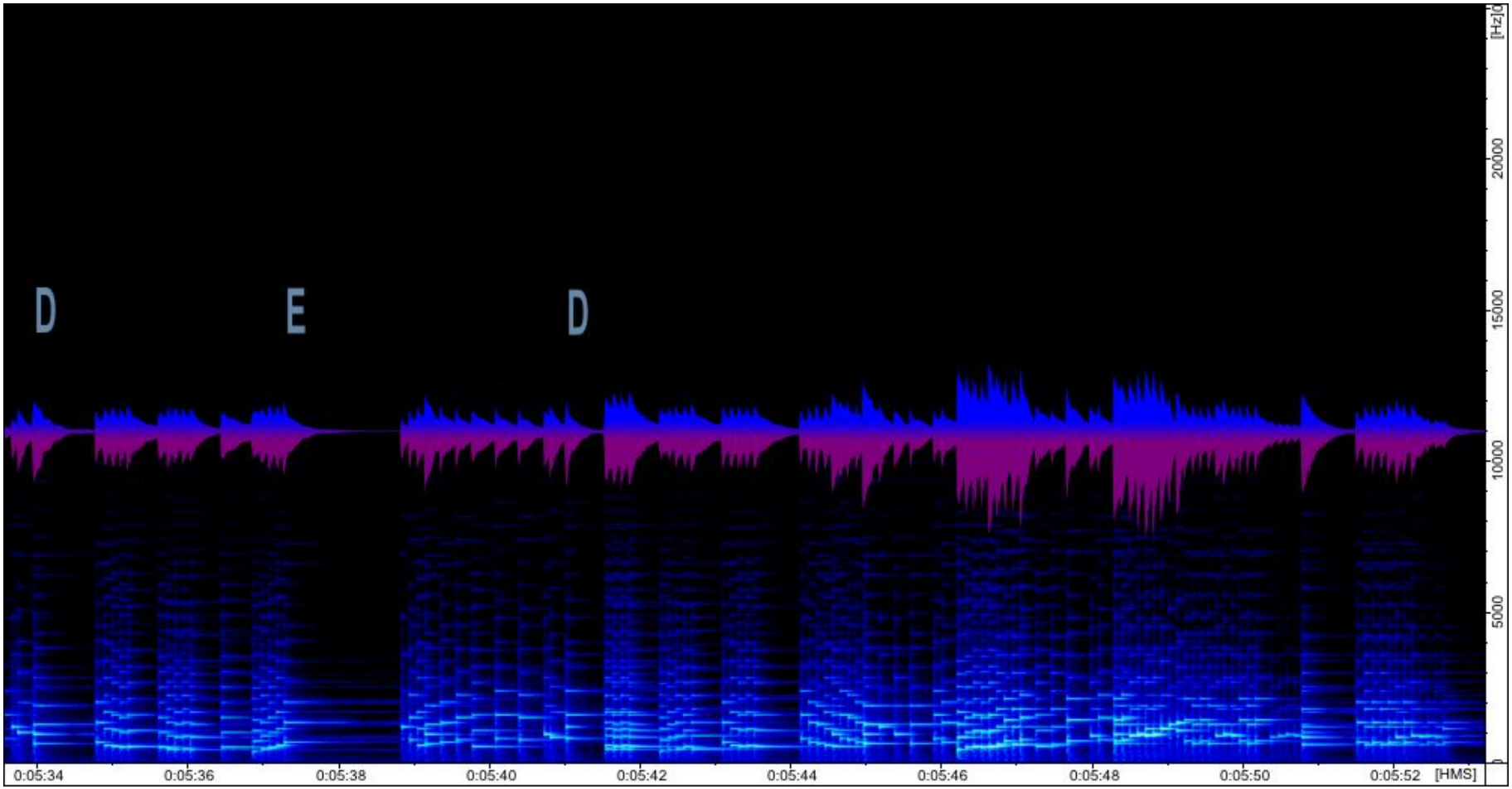

[Hz]0
5000
10000
15000
20000
[HMS]0
0:04:56
0:04:58
0:05:00
0:05:02
0:05:04
0:05:06
0:05:08
0:05:10
0:05:12

m. 172

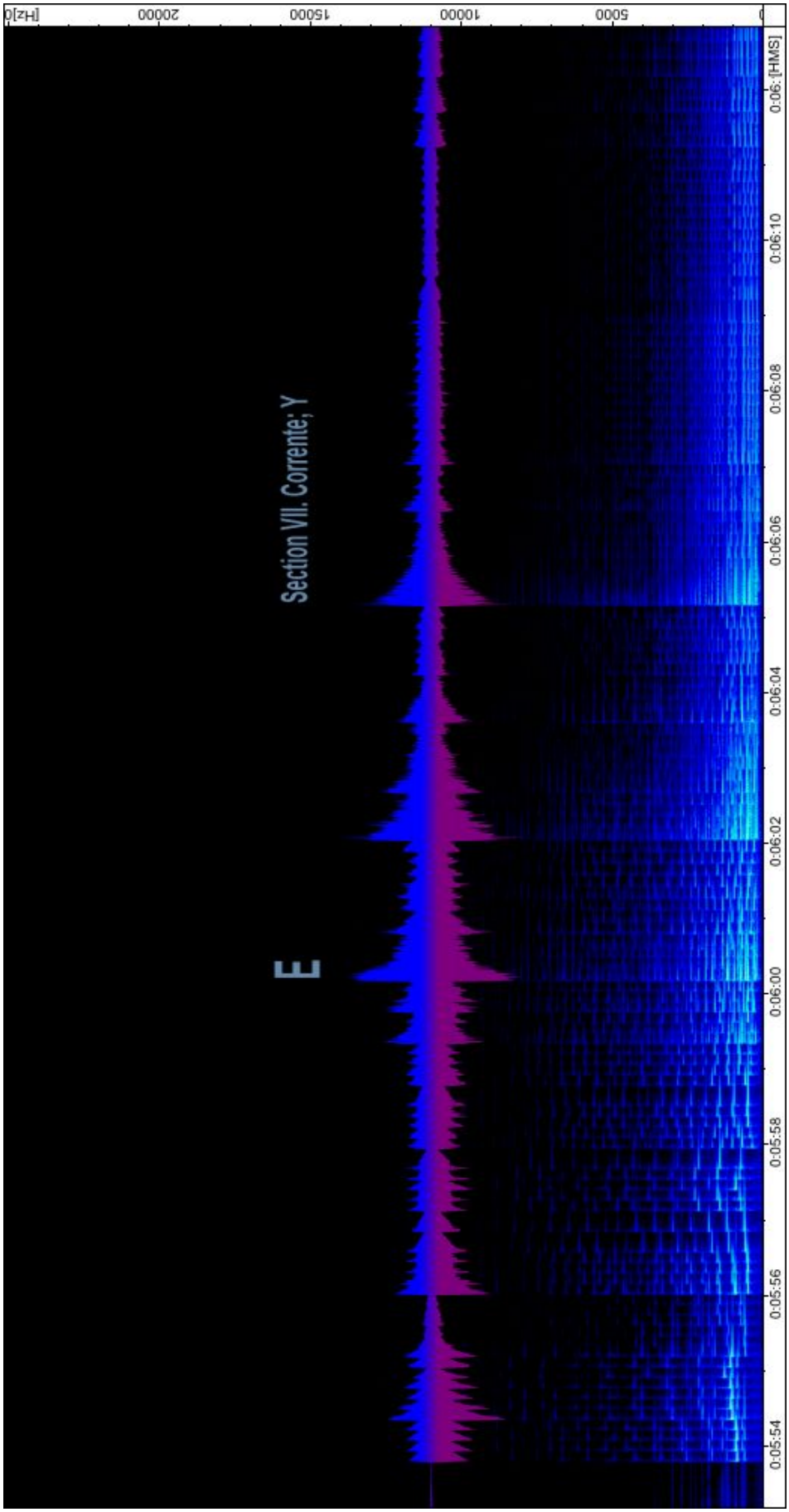

[Hz]0
20000
15000
10000
5000
0
[HMS]
0:05:32
0:05:30
0:05:28
0:05:26
0:05:24
0:05:22
0:05:20
0:05:18
0:05:16
5:14
Section VI. Voices; E
quarter= 64; Y

m. 167

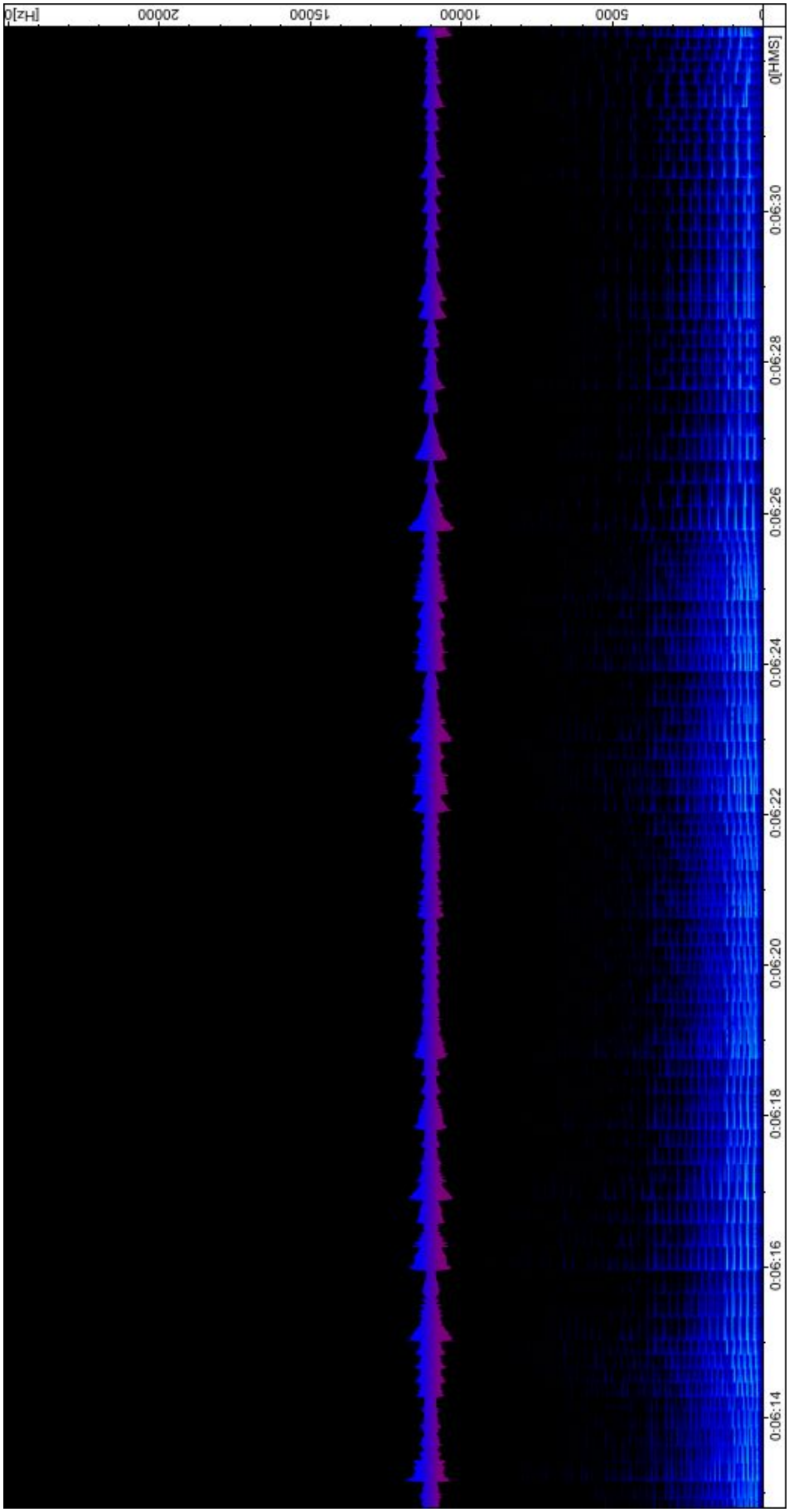
m. 174 m. 176 m. 178



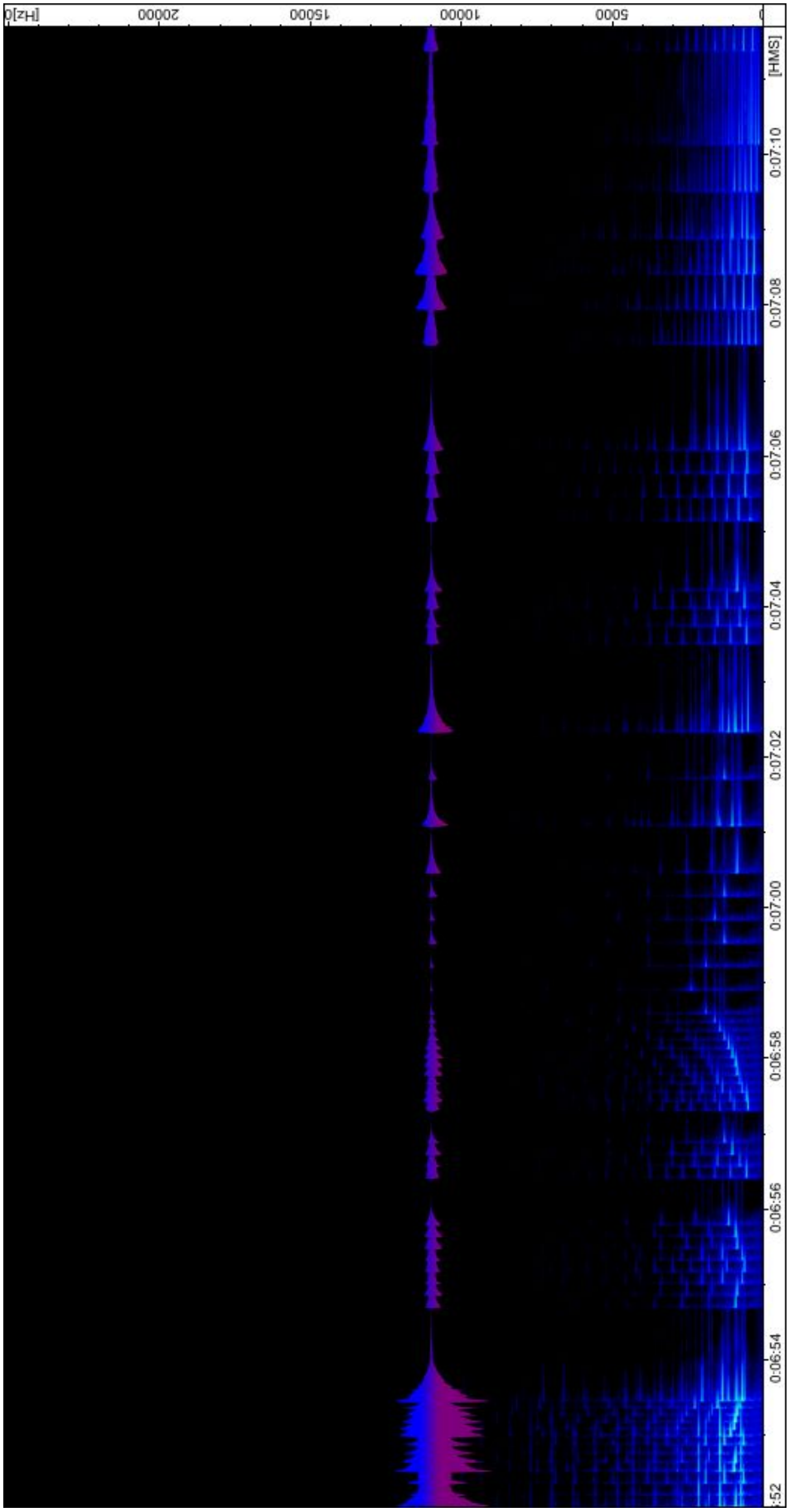
m. 193


E
Section VII. Corrente; Y
[Hz]0
20000
15000
10000
5000
0
0:05:54
0:05:56
0:05:58
0:06:00
0:06:02
0:06:04
0:06:06
0:06:08
0:06:10
0:06:[HMS]

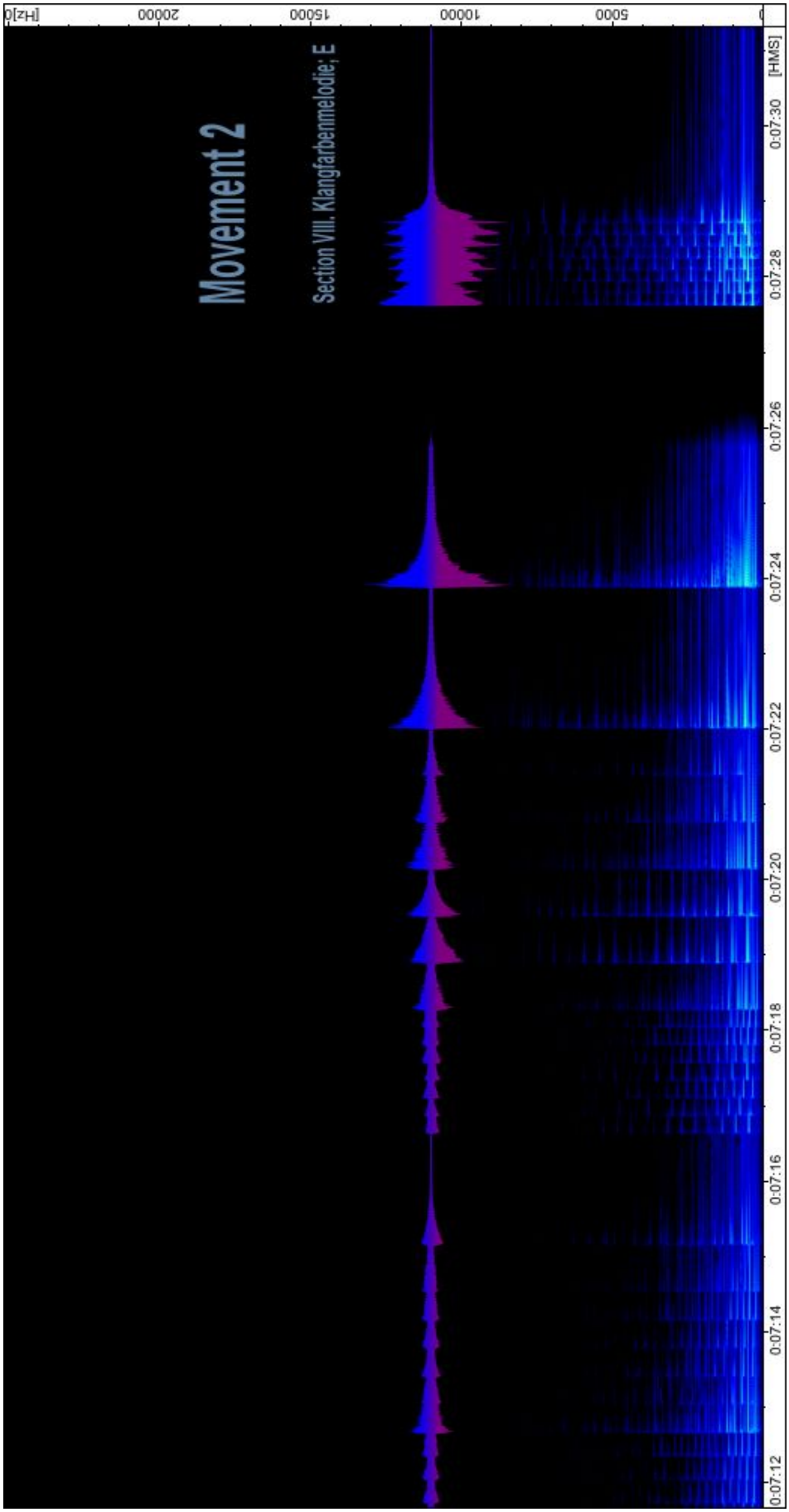
m. 197


0[Hz]
20000
15000
10000
5000
0
0[HMS]
0:06:30
0:06:28
0:06:26
0:06:24
0:06:22
0:06:20
0:06:18
0:06:16
0:06:14

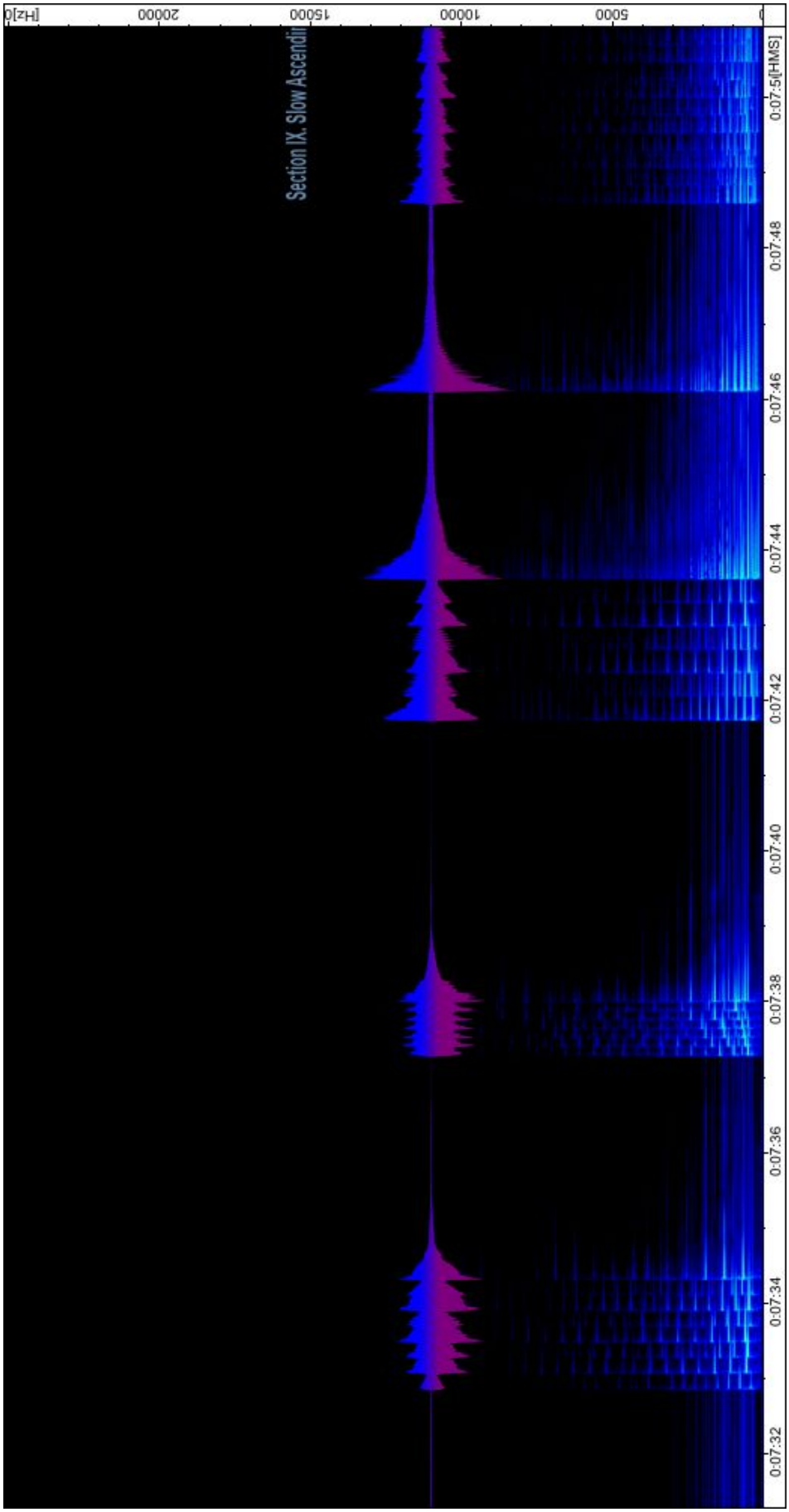
[Hz]0
20000
15000
10000
5000
0
[HMS]6
0:06:50
0:06:48
0:06:46
0:06:44
0:06:42
0:06:40
0:06:38
0:06:36
0:06:34

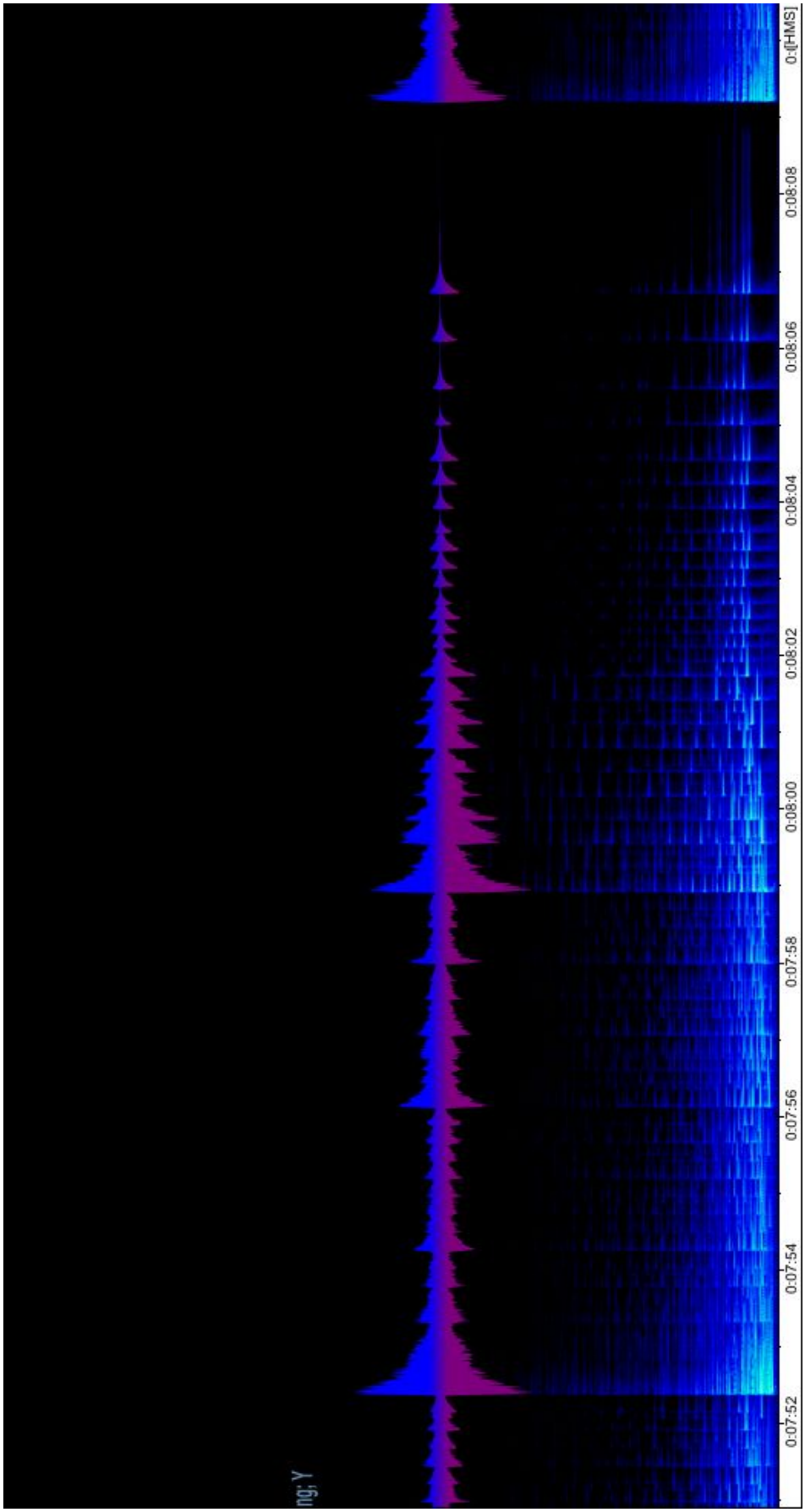

[Hz]0
20000
15000
10000
5000
0
[HMS]
0:07:10
0:07:08
0:07:06
0:07:04
0:07:02
0:07:00
0:06:58
0:06:56
0:06:54
:52

m. 224

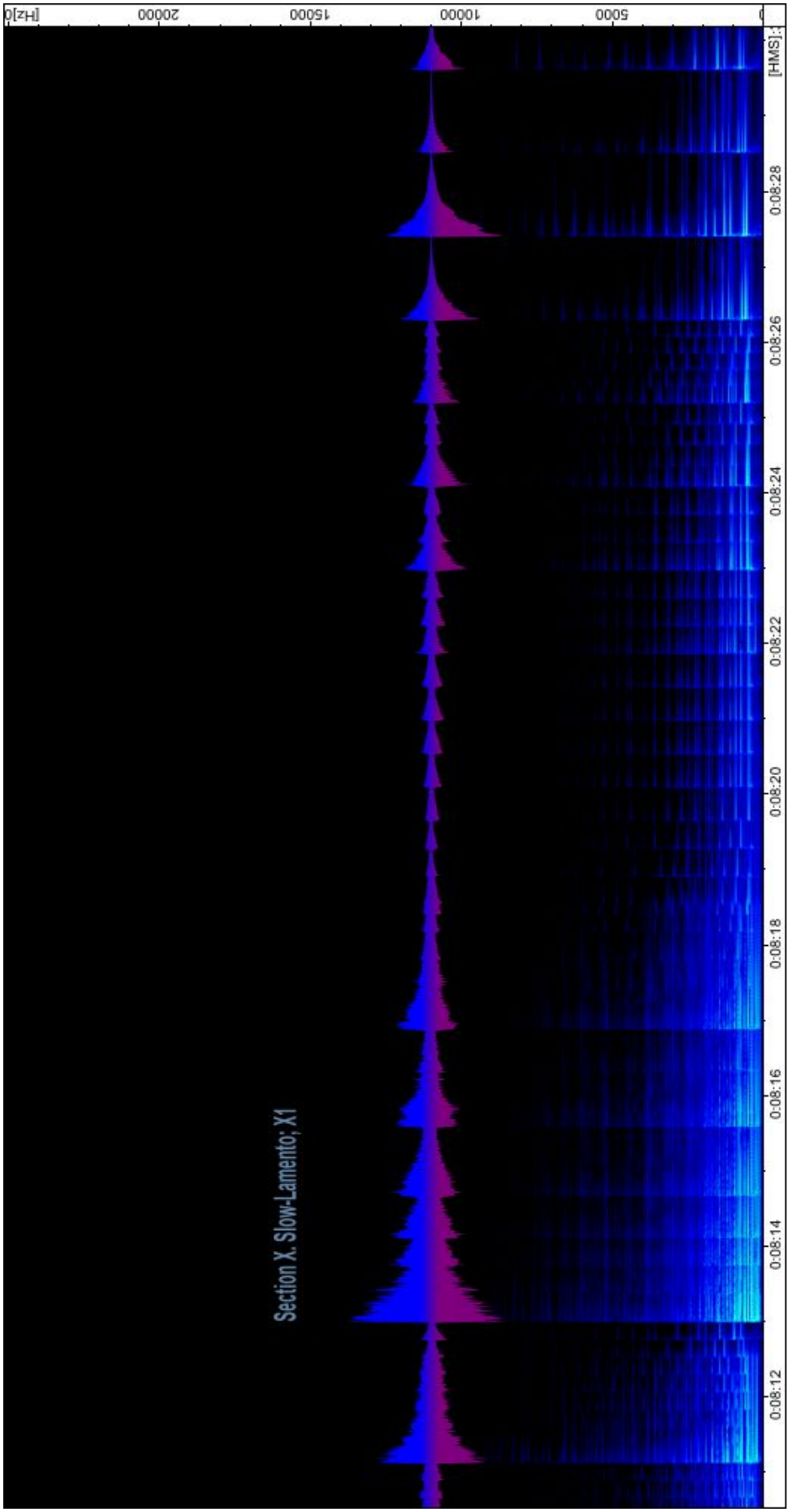

Movement 2
Section VIII. Klangfarbenmelodie; E
[Hz]0
5000
10000
15000
20000
[HMS]
0:07:12
0:07:14
0:07:16
0:07:18
0:07:20
0:07:22
0:07:24
0:07:26
0:07:28
0:07:30

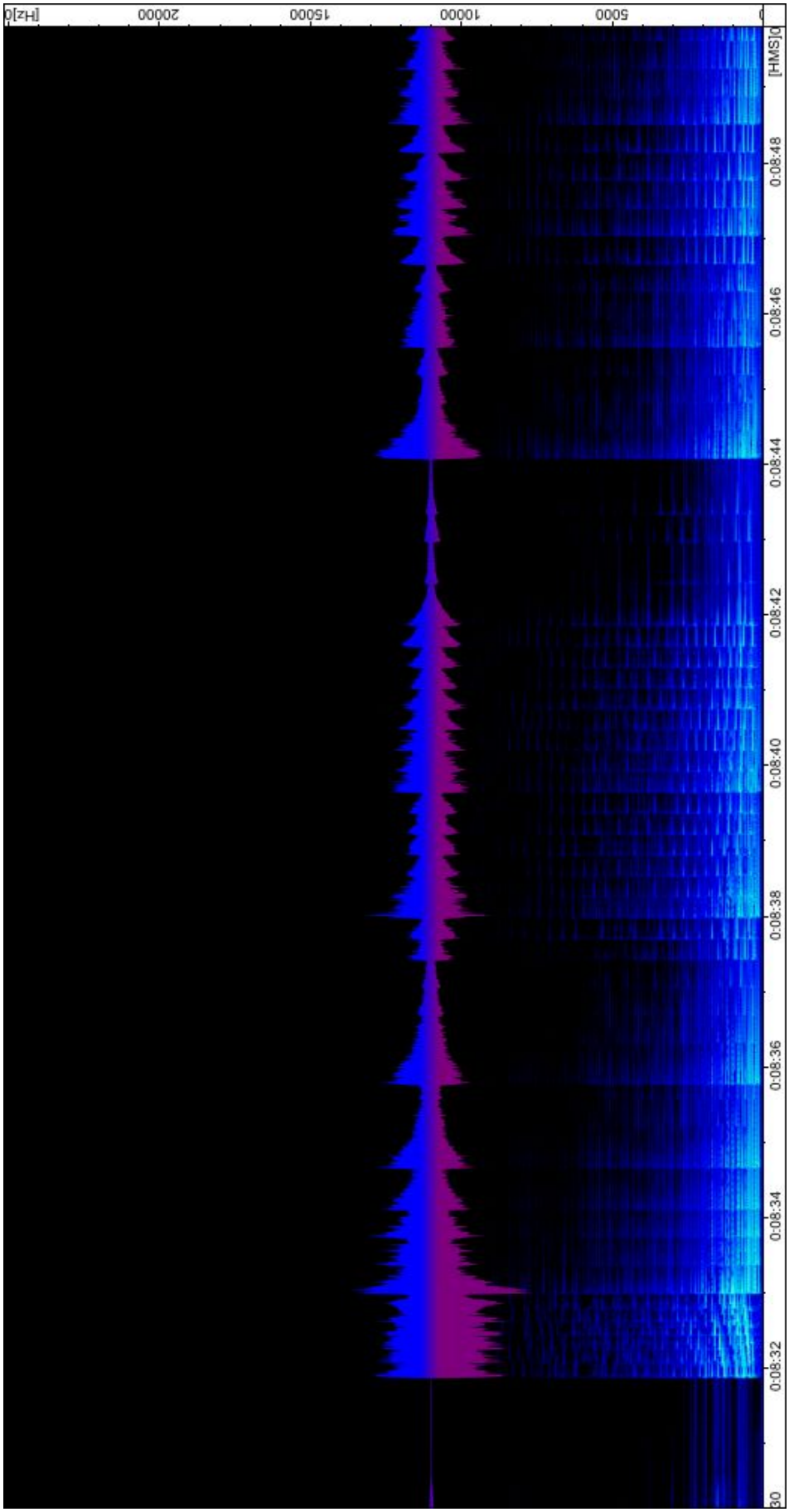
m. 233


[Hz]0
20000
15000
10000
5000
0
Section IX. Slow Ascendir
0:07:5[HMS]
0:07:48
0:07:46
0:07:44
0:07:42
0:07:40
0:07:38
0:07:36
0:07:34
0:07:32

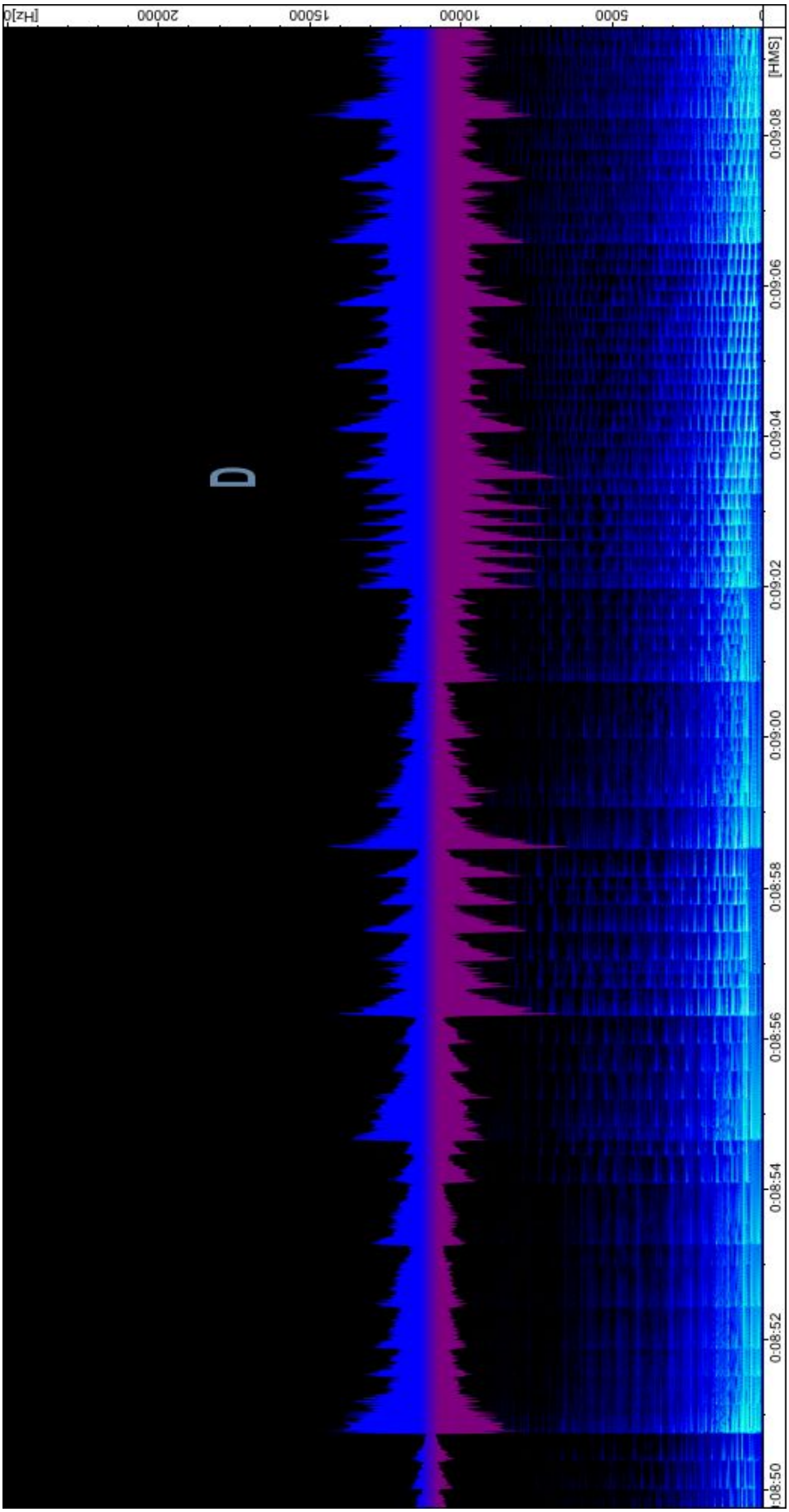

0:[HMS]
0:08:08
0:08:06
0:08:04
0:08:02
0:08:00
0:07:58
0:07:56
0:07:54
0:07:52
ng; Y

m. 240

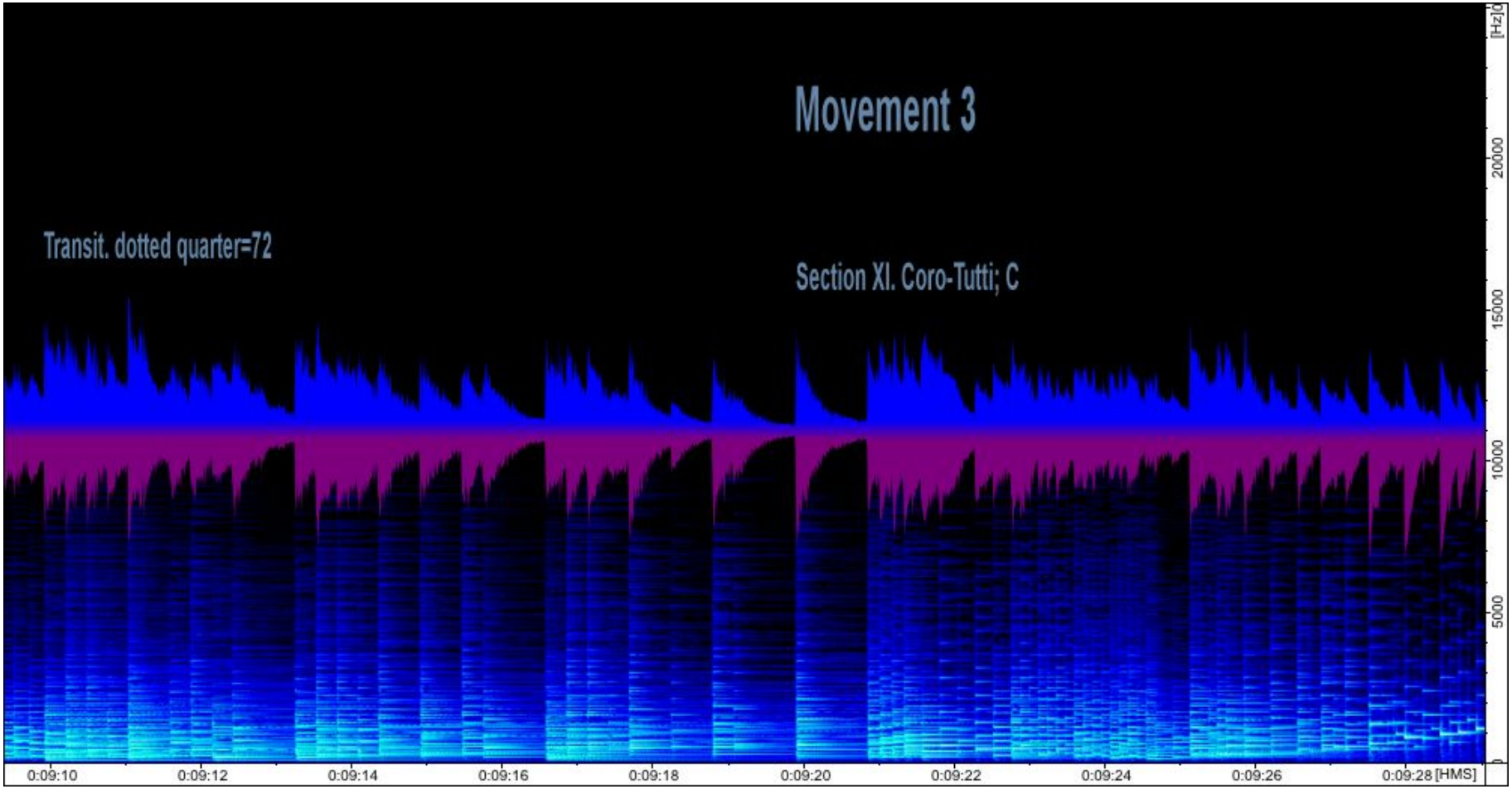

[Hz]0
20000
15000
10000
5000
0
[HMS]:
0:08:28
0:08:26
0:08:24
0:08:22
0:08:20
0:08:18
0:08:16
0:08:14
0:08:12
Section X. Slow-Lamento; X1

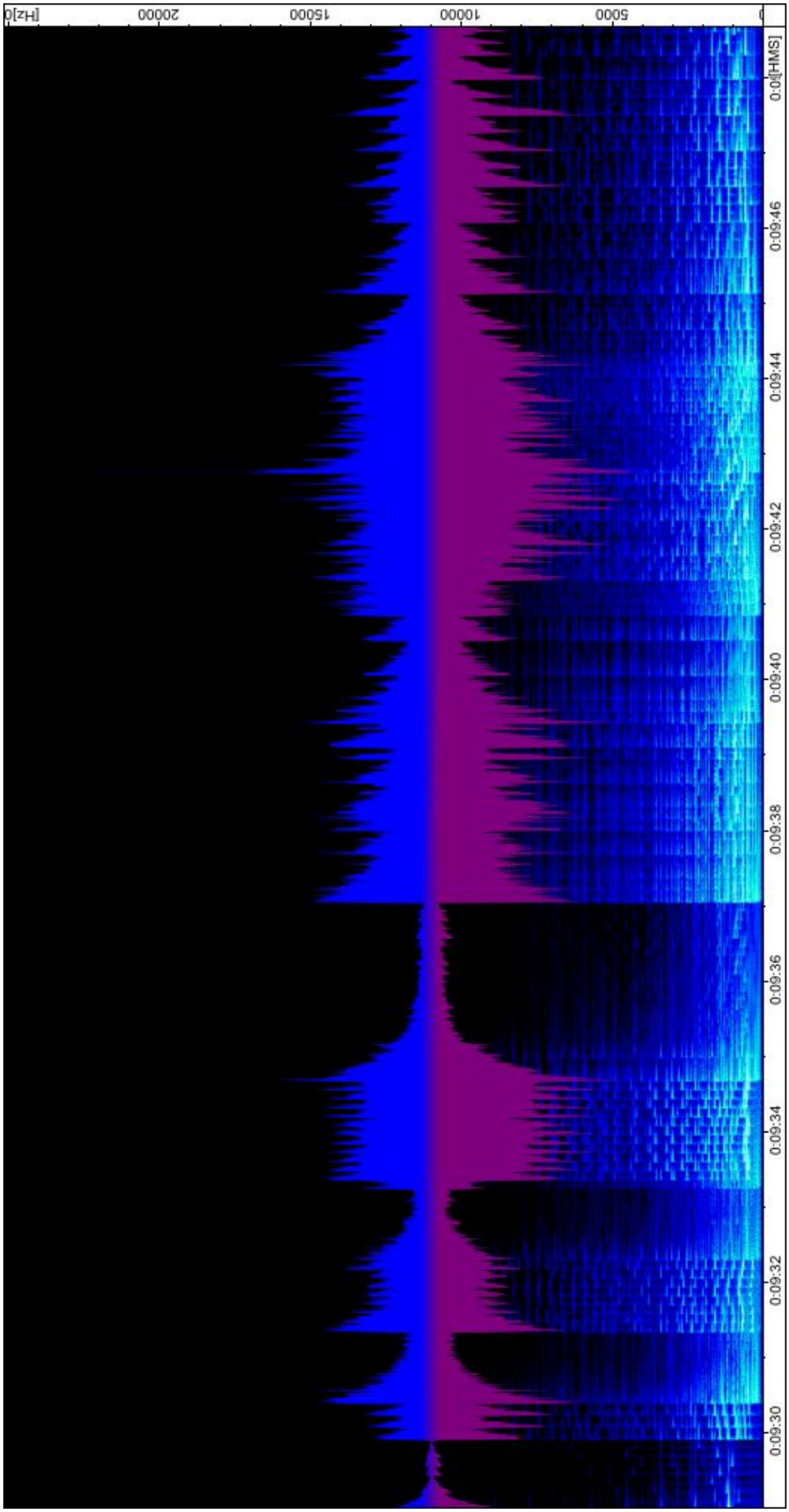

[Hz]0
5000
10000
15000
20000
0
[HMS]0:08:30
0:08:32
0:08:34
0:08:36
0:08:38
0:08:40
0:08:42
0:08:44
0:08:46
0:08:48

m. 254

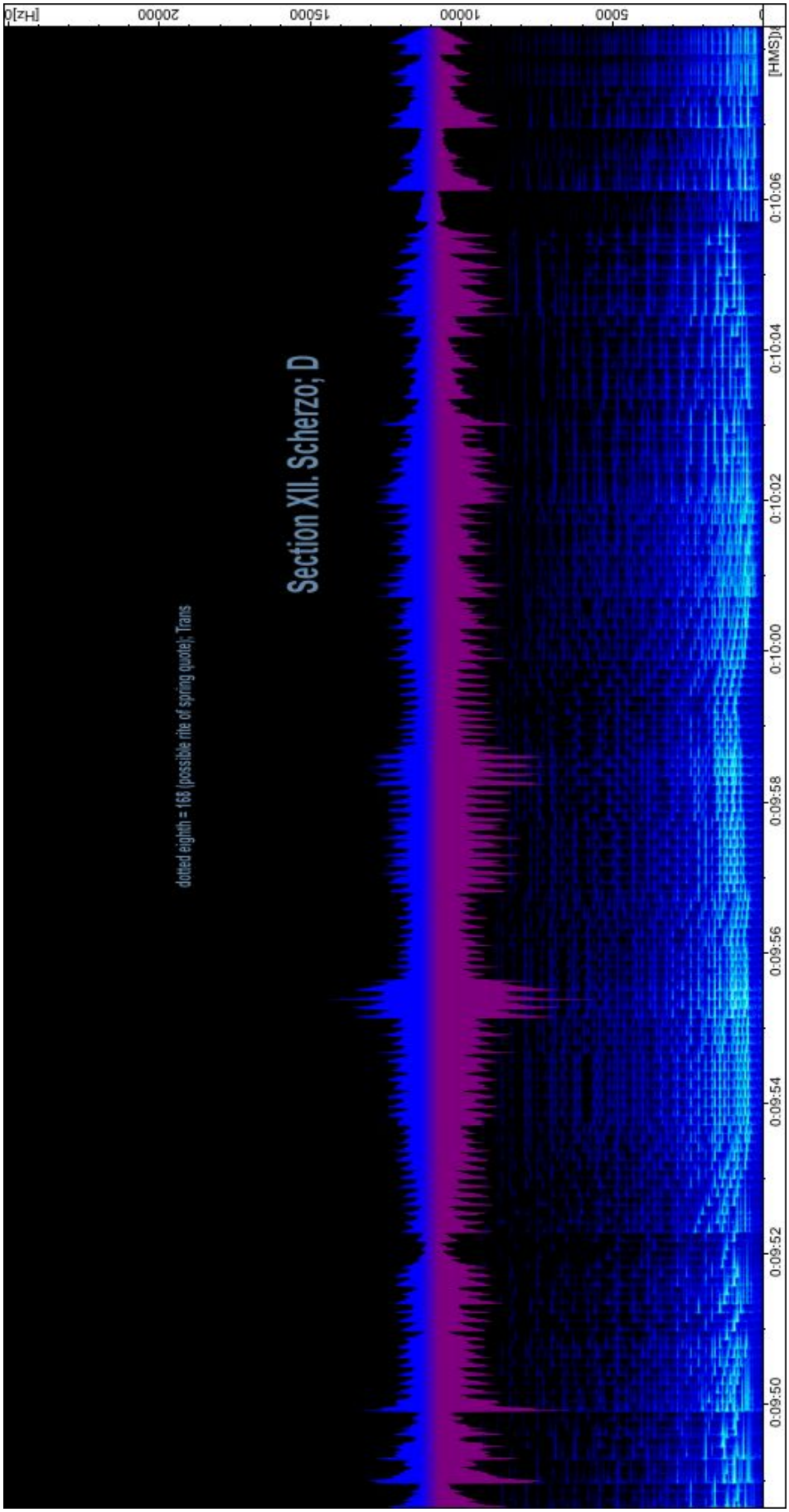

[Hz]0
20000
15000
10000
5000
0
[HMS]
0:08:50
0:08:52
0:08:54
0:08:56
0:08:58
0:09:00
0:09:02
0:09:04
0:09:06
0:09:08
D

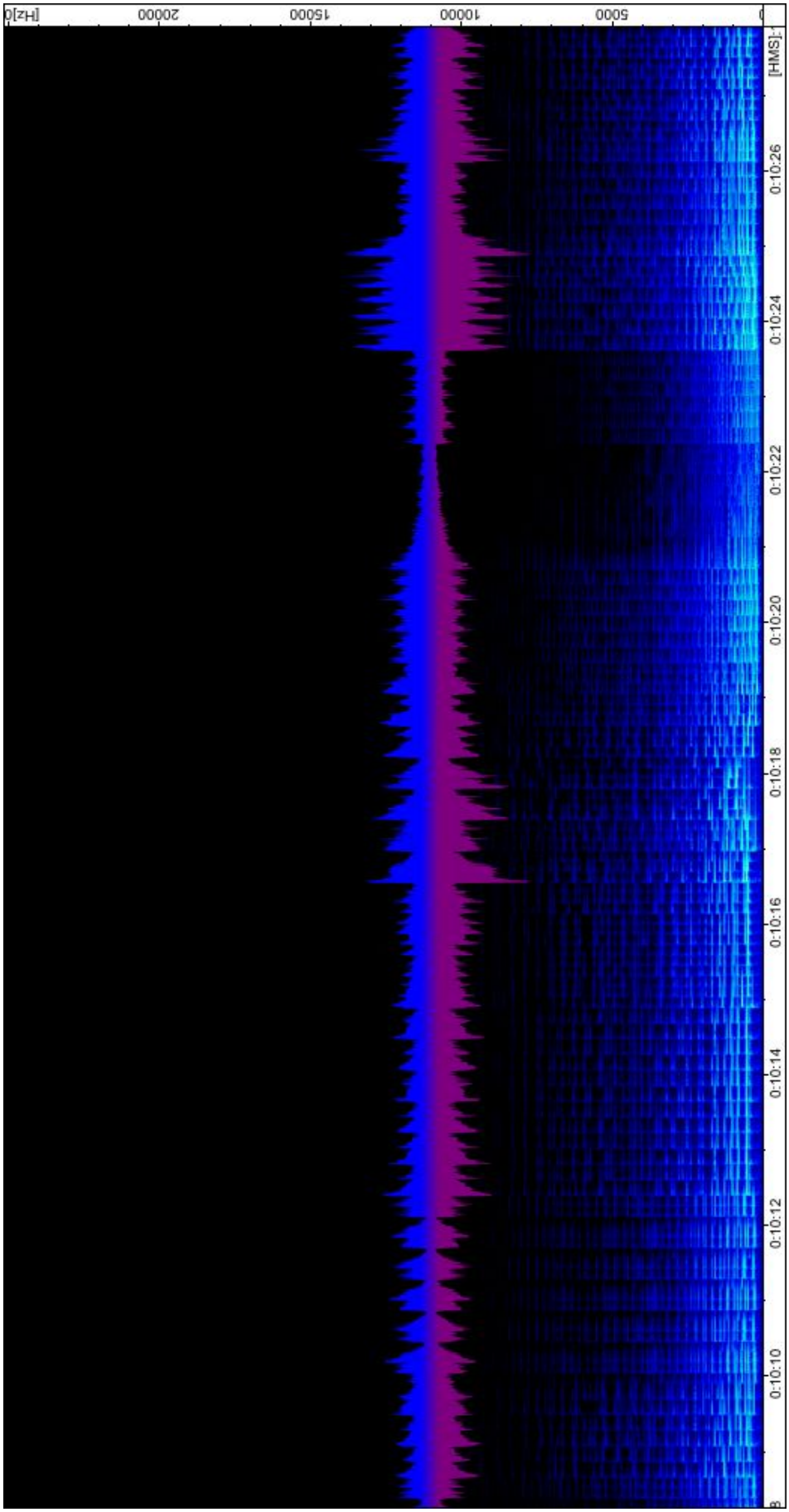
m. 258 m. 261


Movement 3
Transit. dotted quarter=72
Section XI. Coro-Tutti; C
0:09:10
0:09:12
0:09:14
0:09:16
0:09:18
0:09:20
0:09:22
0:09:24
0:09:26
0:09:28 [HMS]
[Hz]
20000
15000
10000
5000
0


[Hz]0
20000
15000
10000
5000
0
0:09[HMS]
0:09:46
0:09:44
0:09:42
0:09:40
0:09:38
0:09:36
0:09:34
0:09:32
0:09:30

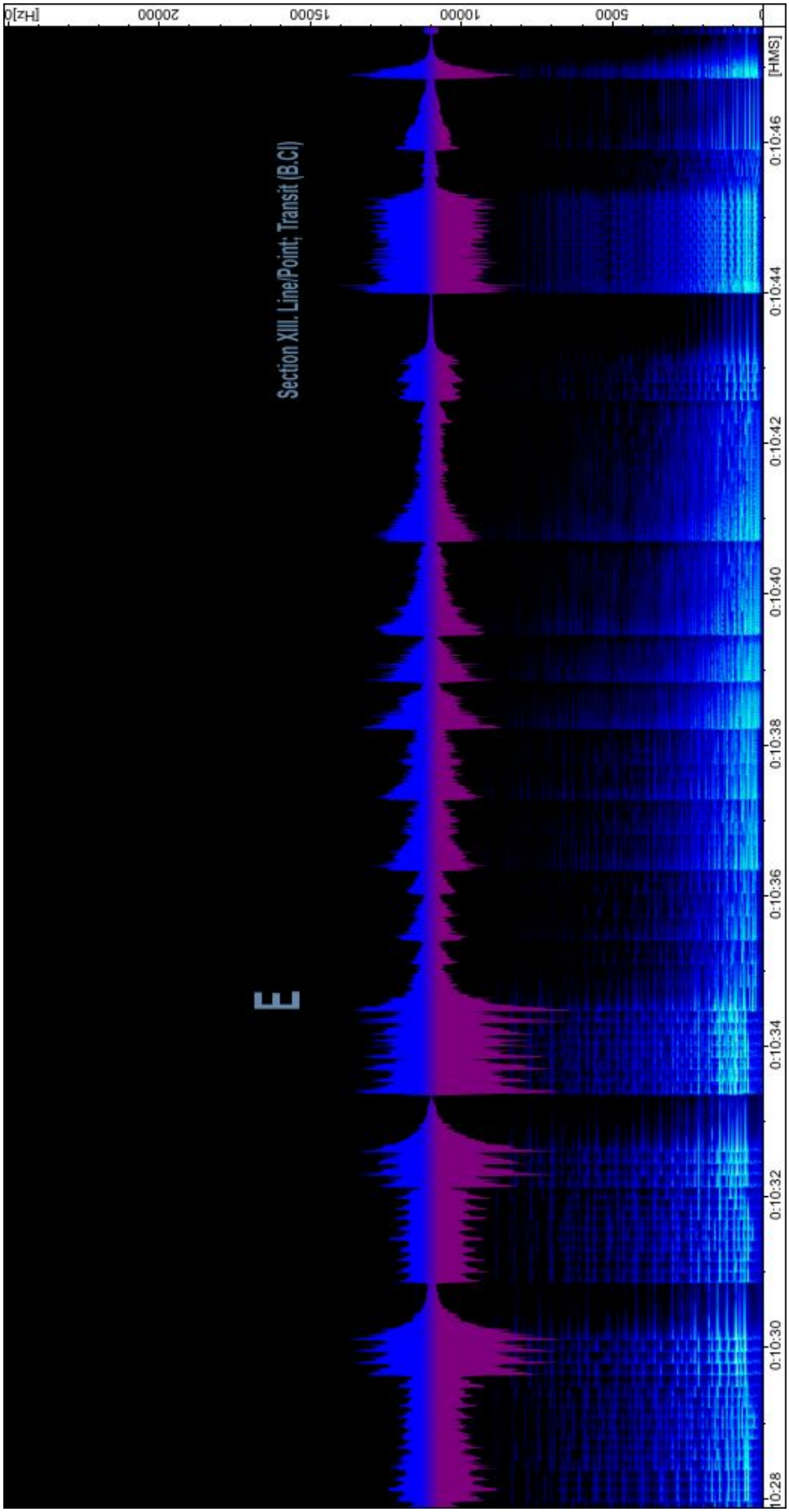
m. 286

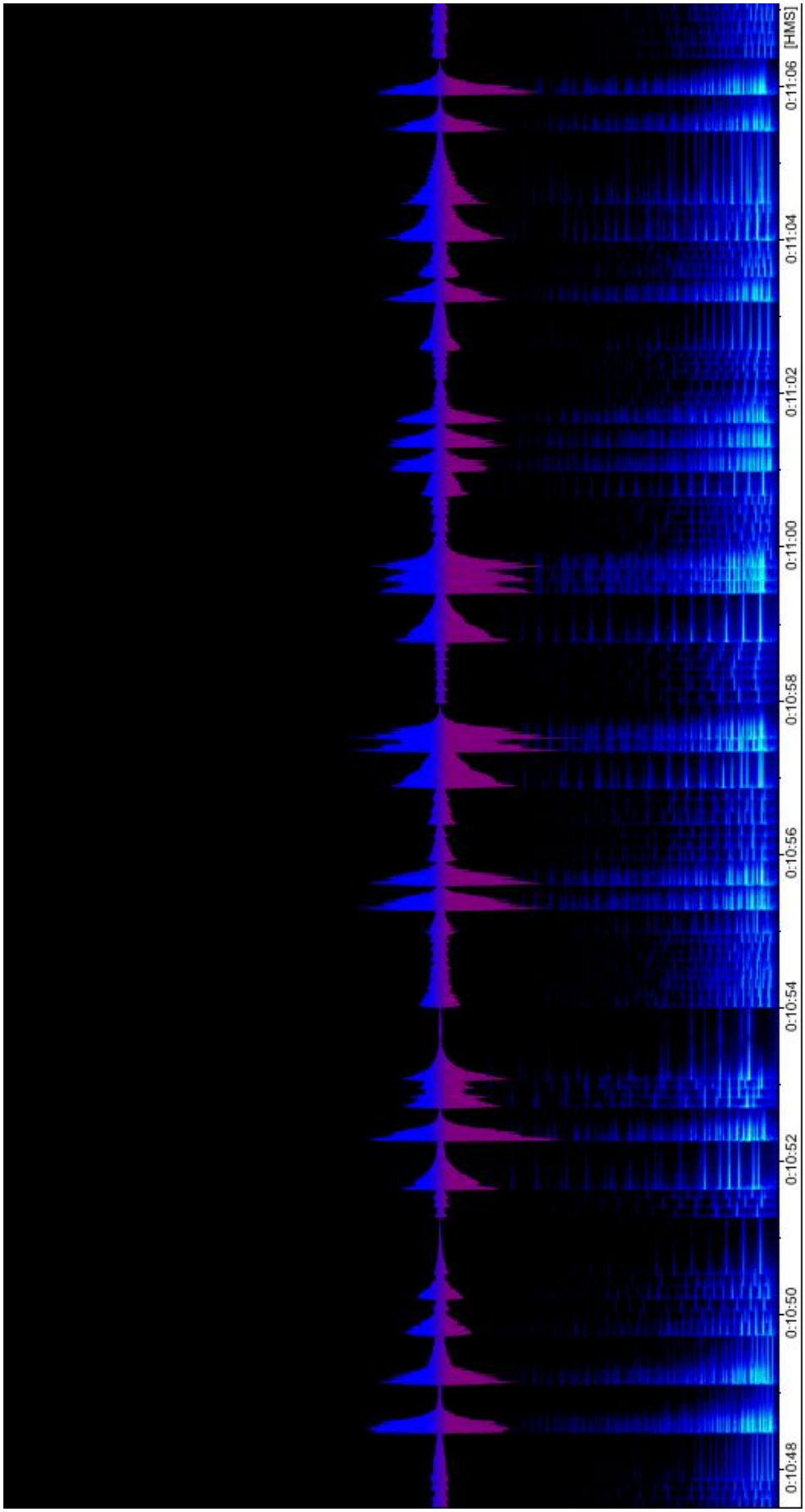

Section XII, Scherzo; D
dotted eighth = 168 (possible rite of spring quote); Trans
[Hz]0
20000
15000
10000
5000
0
[HMS]
0:09:50
0:09:52
0:09:54
0:09:56
0:09:58
0:10:00
0:10:02
0:10:04
0:10:06

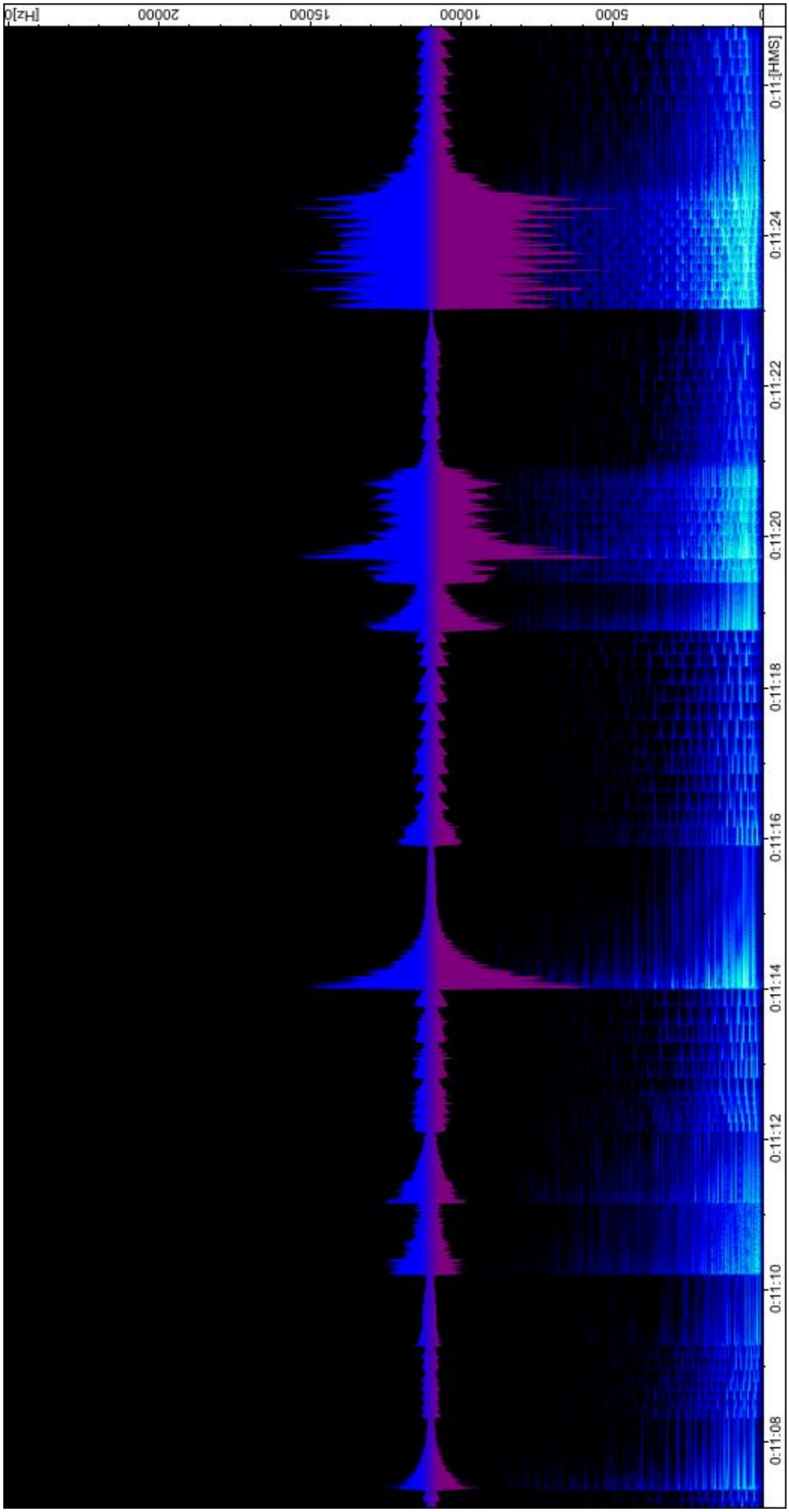

[Hz]0
5000
10000
15000
20000
[HMS]
0:10:10
0:10:12
0:10:14
0:10:16
0:10:18
0:10:20
0:10:22
0:10:24
0:10:26

m. 311

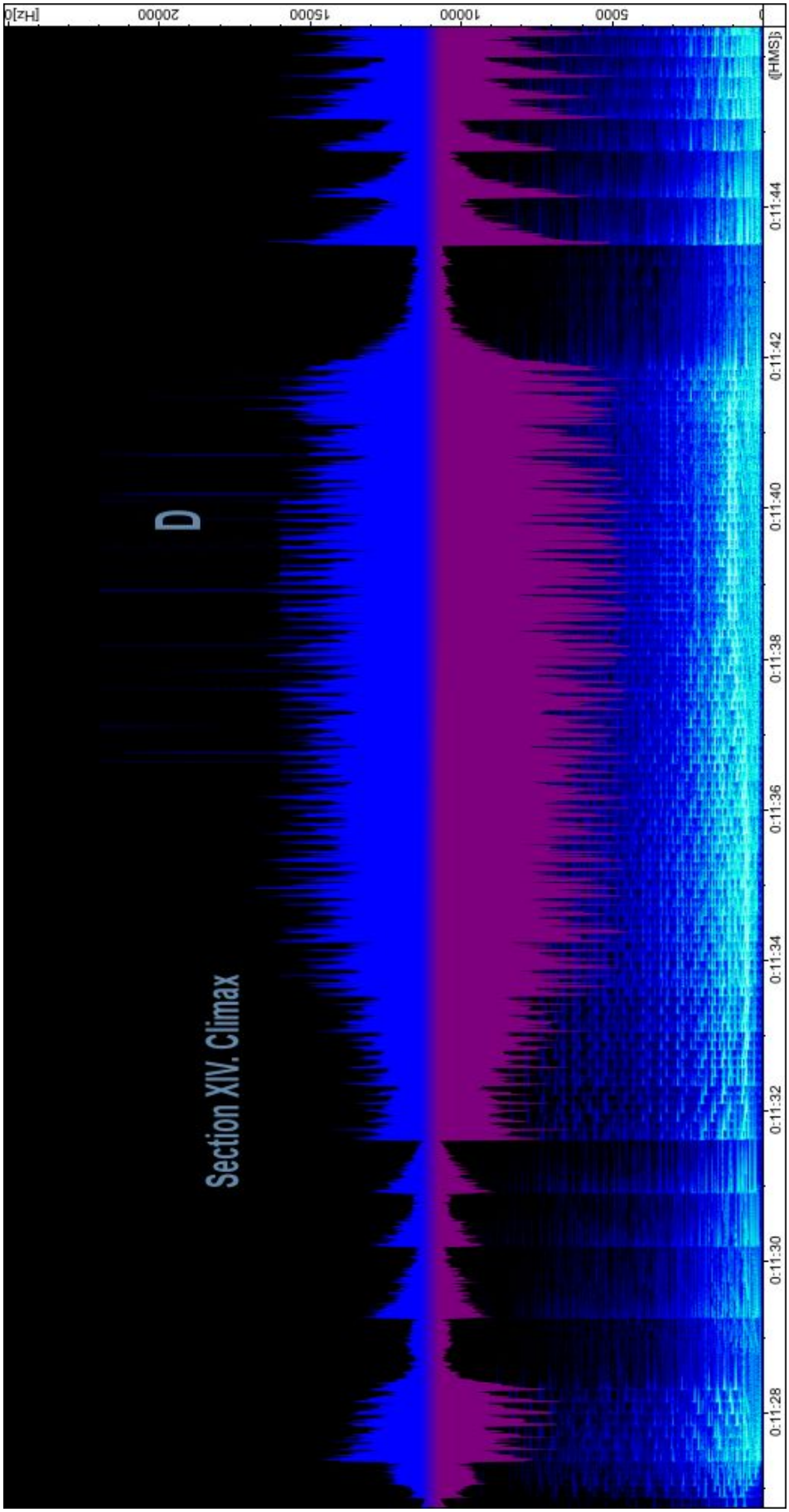
m. 315


E
Section XIII. Line/Point; Transit (B.Cl)
[Hz]
20000
15000
10000
5000
0
[HMS]
0:10:28
0:10:30
0:10:32
0:10:34
0:10:36
0:10:38
0:10:40
0:10:42
0:10:44
0:10:46

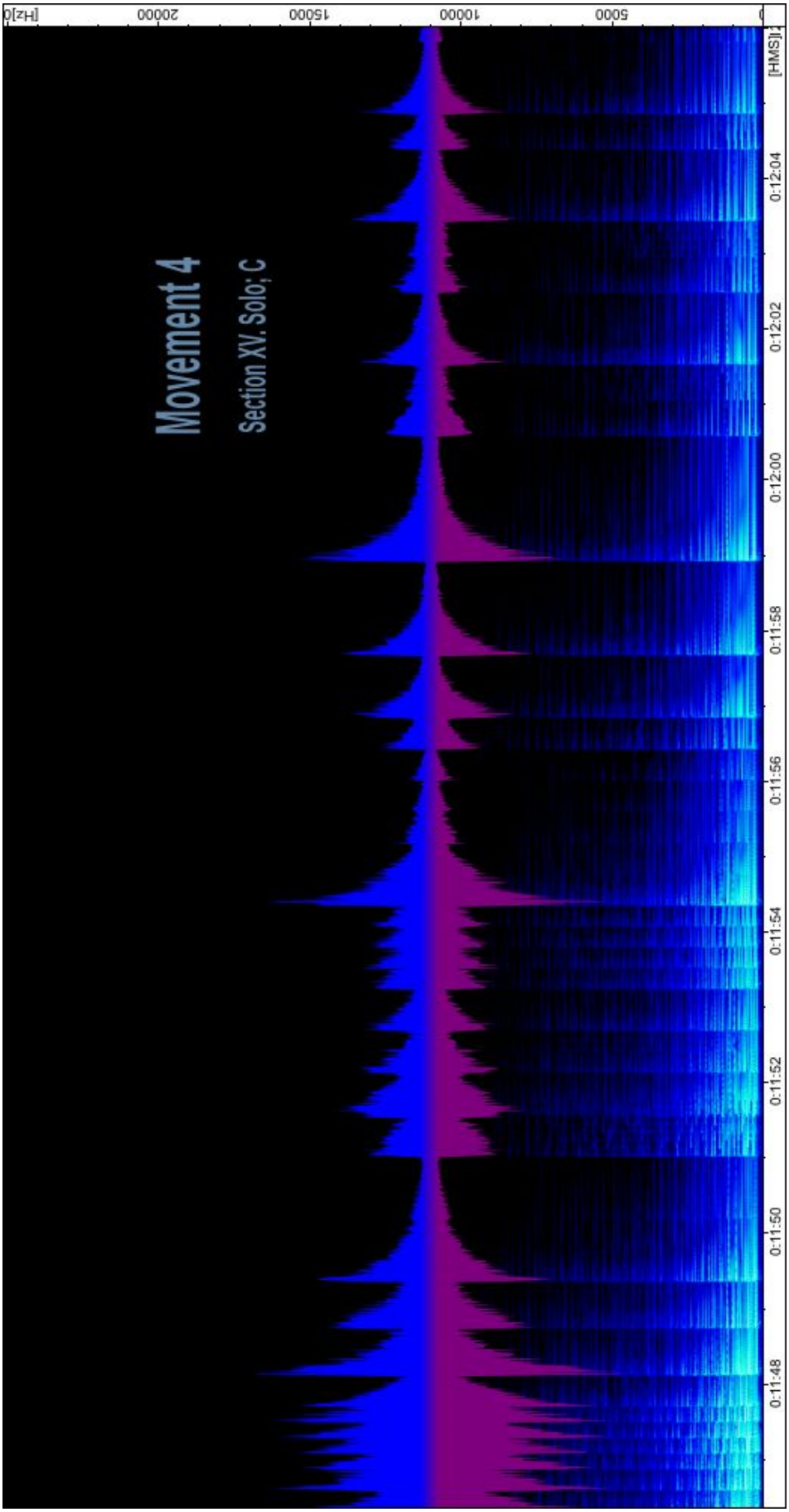

[HMS]
0:11:06
0:11:04
0:11:02
0:11:00
0:10:58
0:10:56
0:10:54
0:10:52
0:10:50
0:10:48


[Hz]0
20000
15000
10000
5000
0
[HMS]
0:11:08
0:11:10
0:11:12
0:11:14
0:11:16
0:11:18
0:11:20
0:11:22
0:11:24

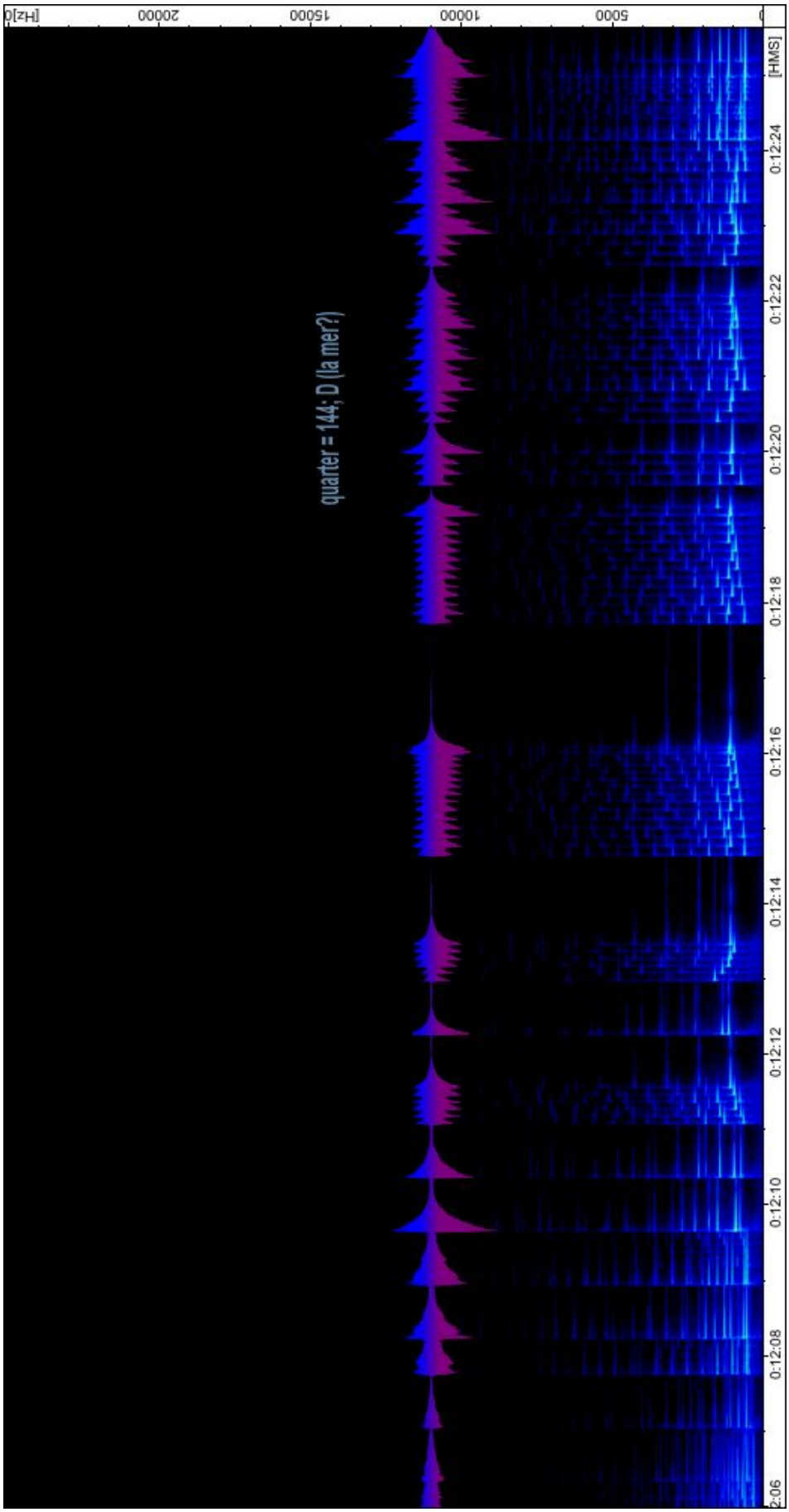
m. 347


Section XIV. Climax
D
[Hz]0
20000
15000
10000
5000
0
(HMS)
0:11:28
0:11:30
0:11:32
0:11:34
0:11:36
0:11:38
0:11:40
0:11:42
0:11:44

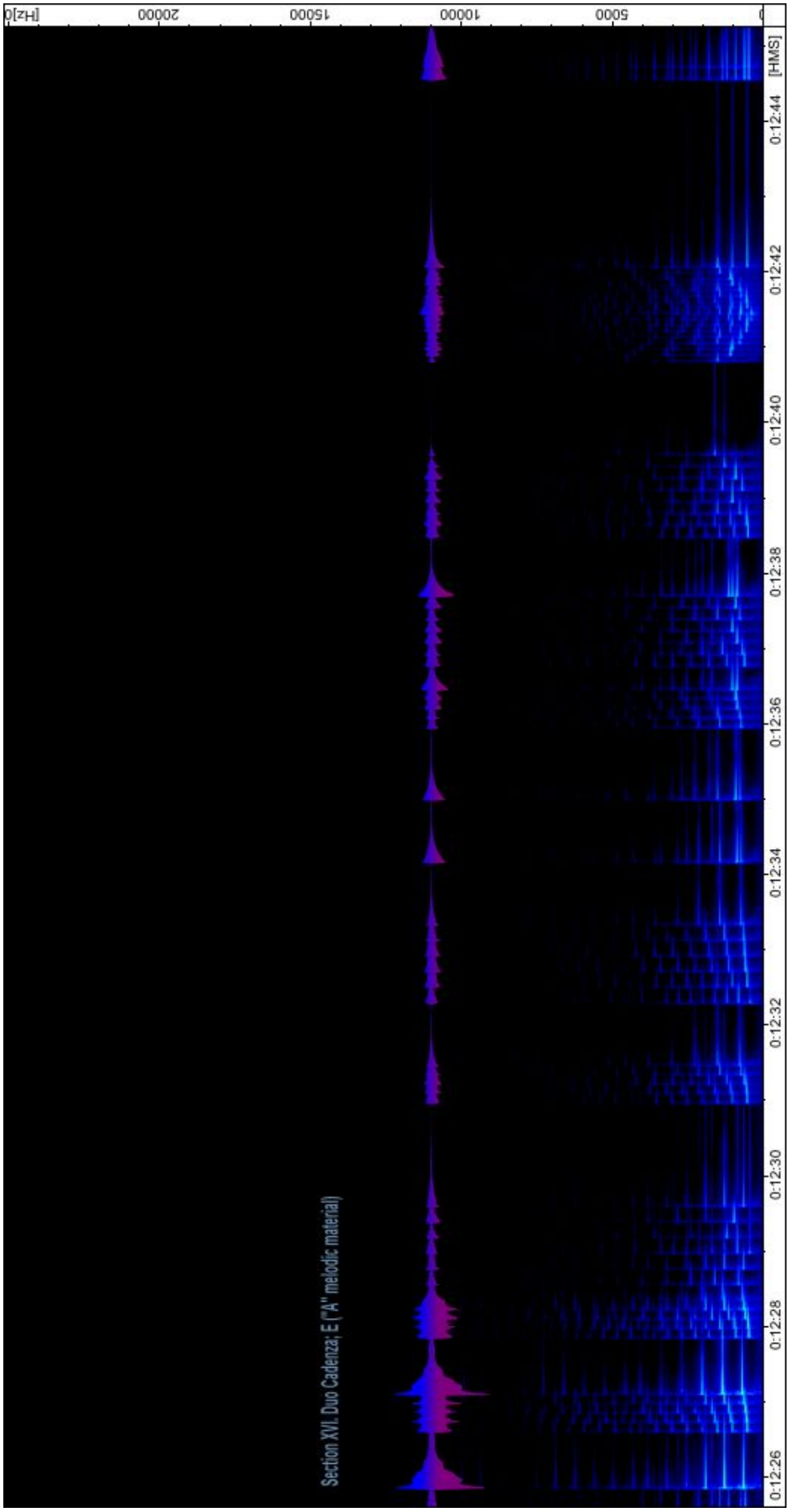
m. 360

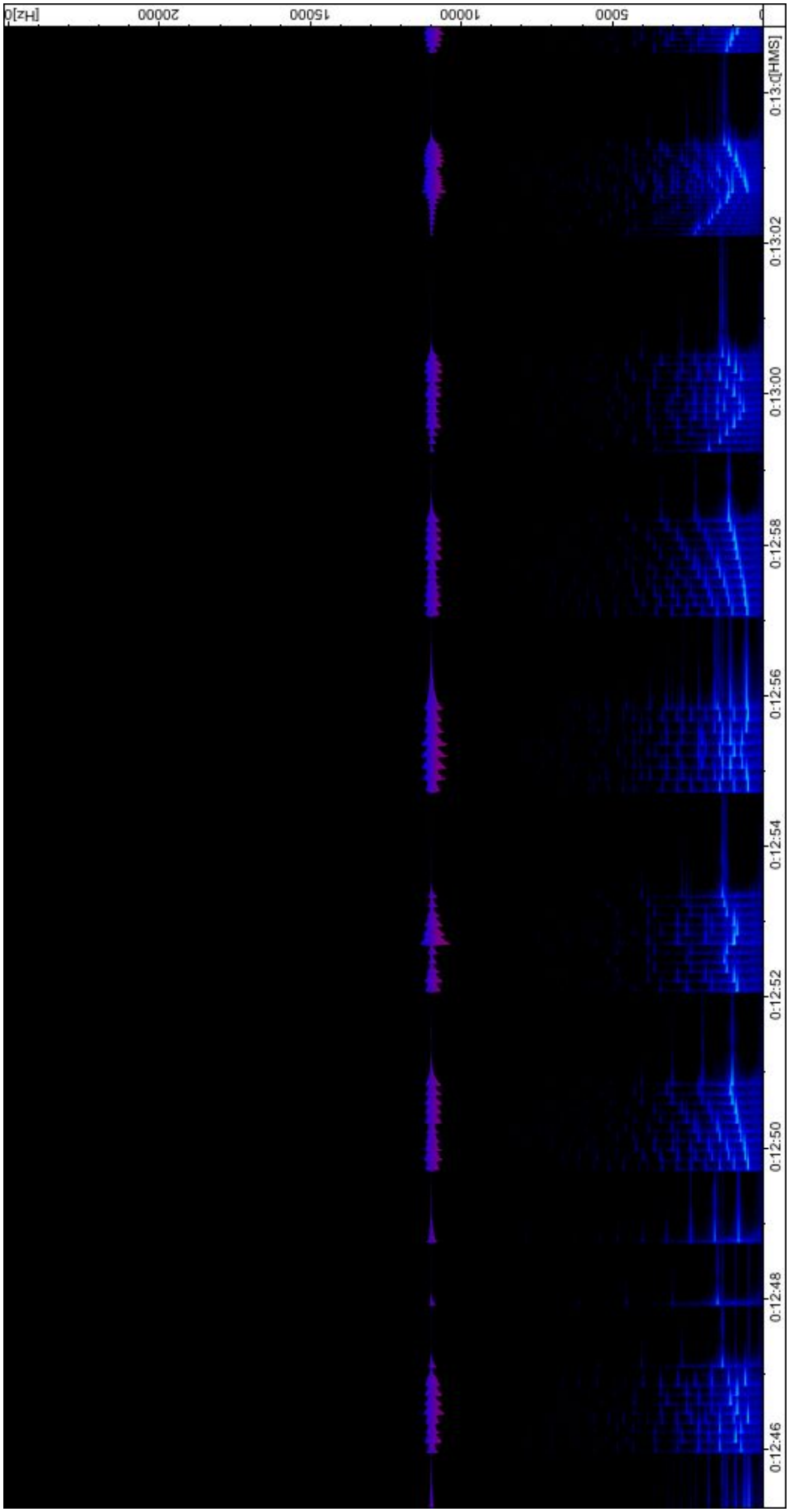

Movement 4
Section XV. Solo; C
[Hz]
20000
15000
10000
5000
0
[HMS]
0:11:48
0:11:50
0:11:52
0:11:54
0:11:56
0:11:58
0:12:00
0:12:02
0:12:04

m. 370

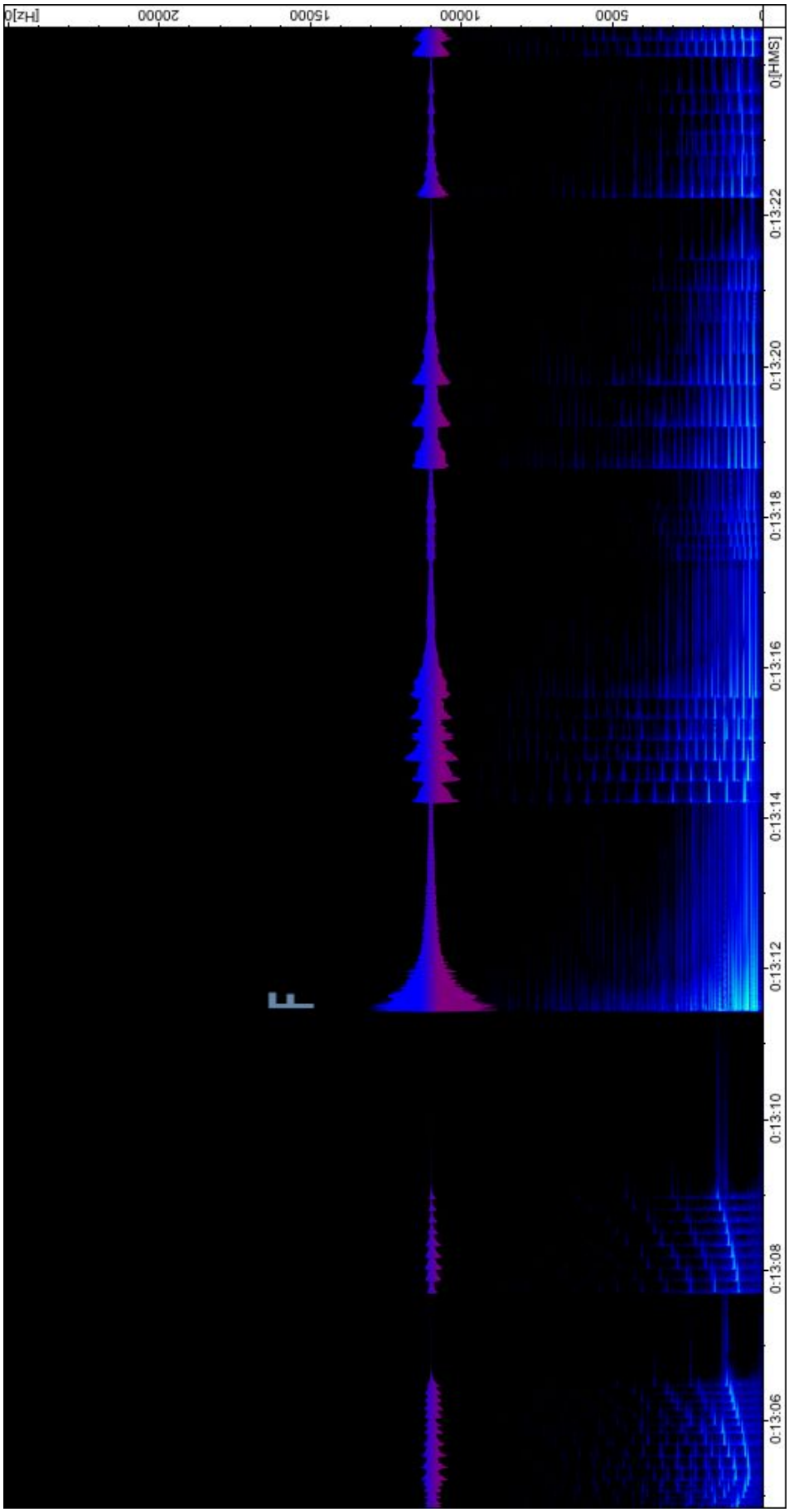

quarter = 144; D (la mer?)
[Hz]
20000
15000
10000
5000
0
[HMS]
0:12:24
0:12:22
0:12:20
0:12:18
0:12:16
0:12:14
0:12:12
0:12:10
0:12:08
2:06

m. 374


[Hz]0
20000
15000
10000
5000
0
[HMS]
0:12:44
0:12:42
0:12:40
0:12:38
0:12:36
0:12:34
0:12:32
0:12:30
0:12:28
0:12:26
Section XVI. Duo Cadenza; E ("A" melodic material)

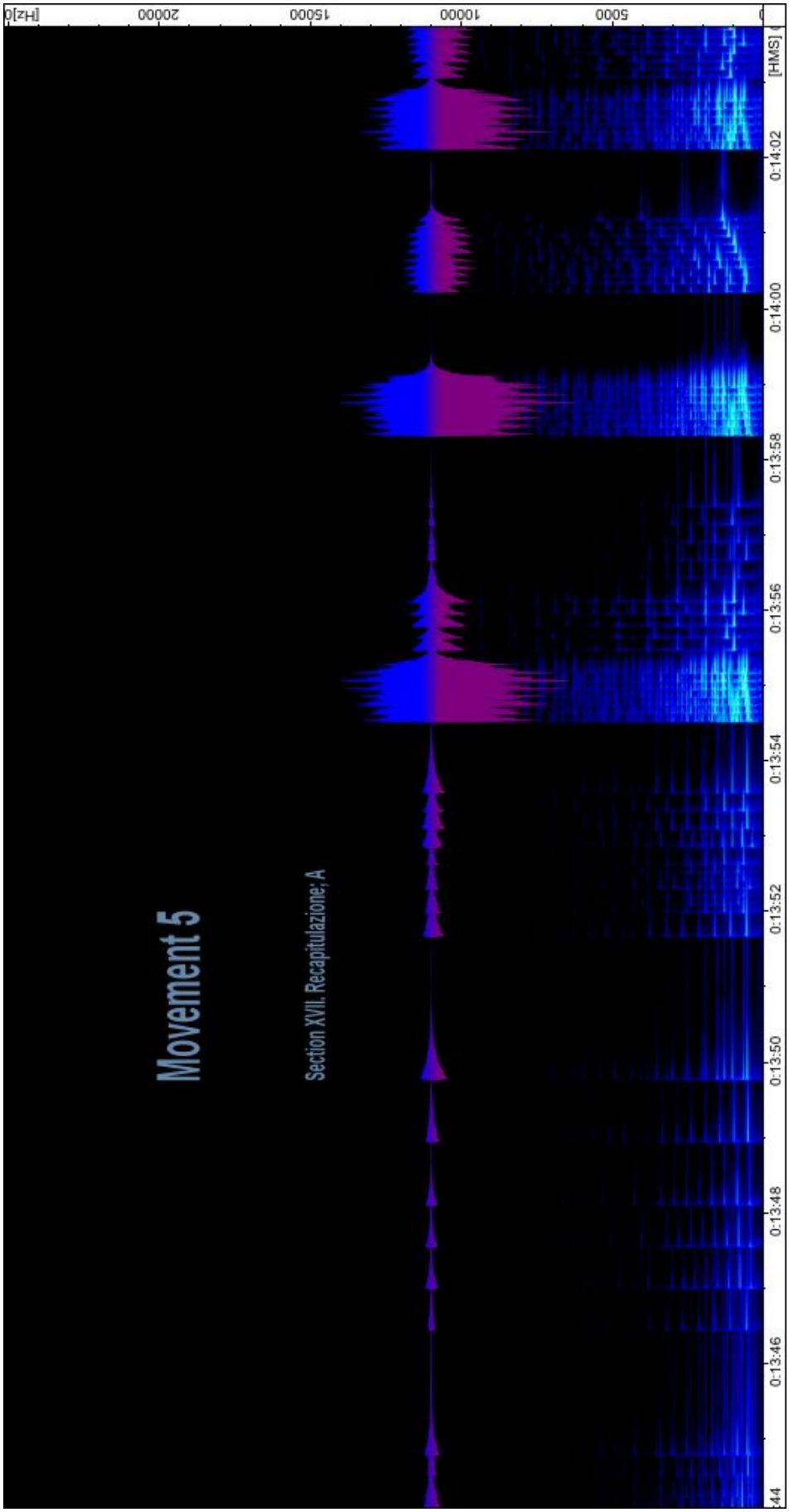

[Hz]0
20000
15000
10000
5000
0
0:13:0[HMS]
0:13:02
0:13:00
0:12:58
0:12:56
0:12:54
0:12:52
0:12:50
0:12:48
0:12:46

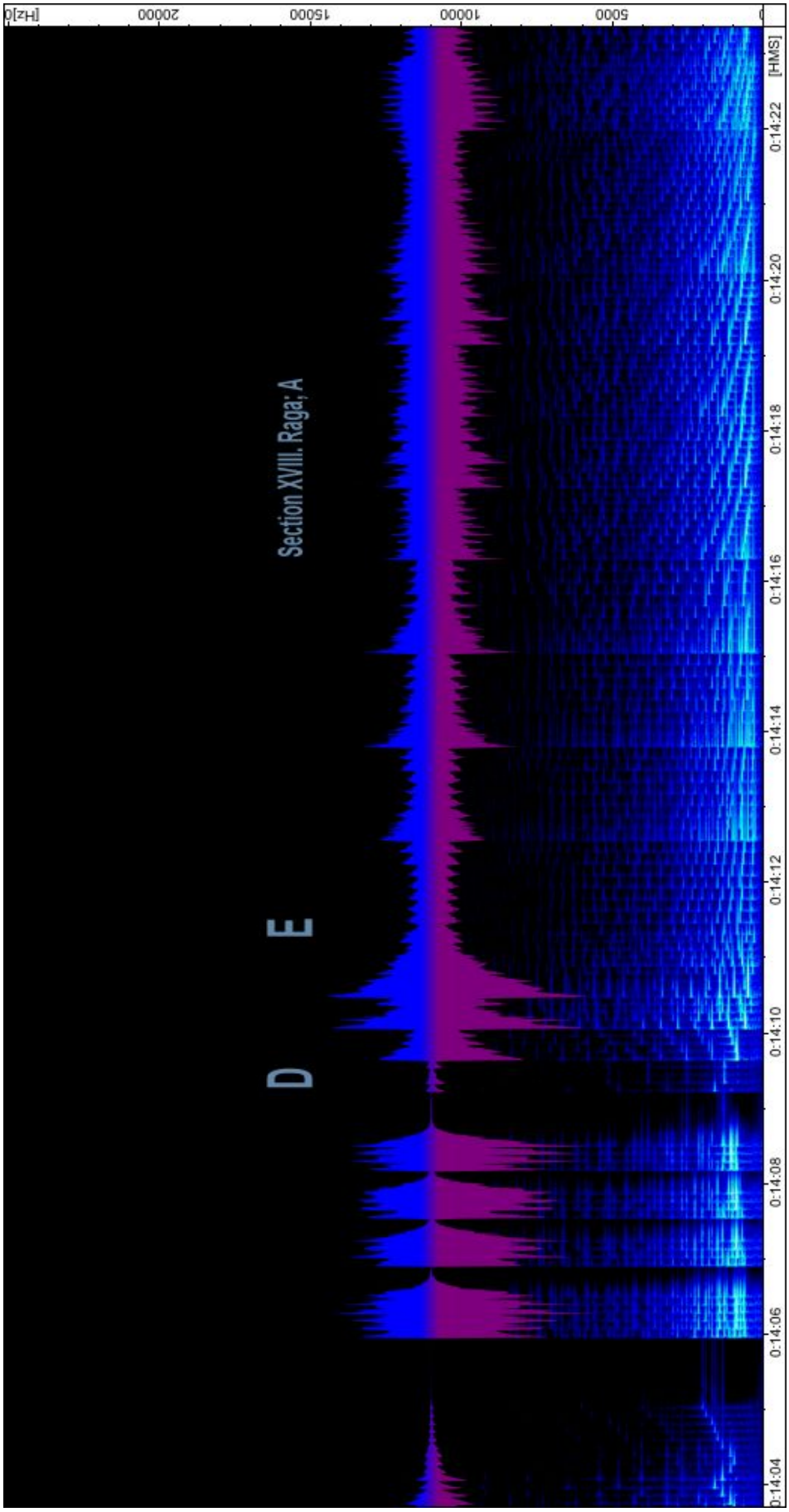
m. 393

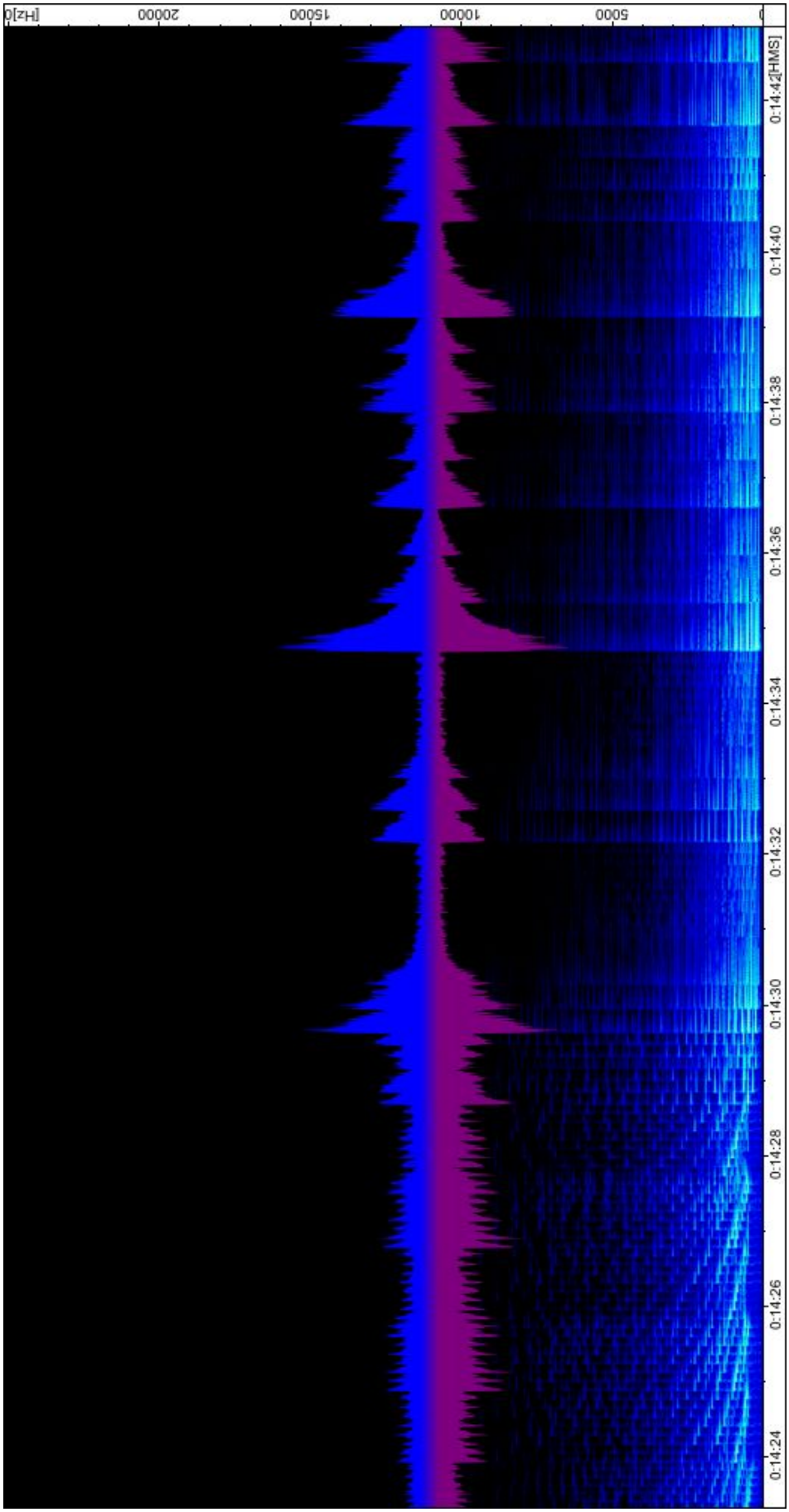

[Hz]0
20000
15000
10000
5000
0
0[HMS]
0:13:22
0:13:20
0:13:18
0:13:16
0:13:14
0:13:12
0:13:10
0:13:08
0:13:06
F

[Hz]0
20000
15000
10000
5000
0
[HMS]
0:13:42
0:13:40
0:13:38
0:13:36
0:13:34
0:13:32
0:13:30
0:13:28
0:13:26

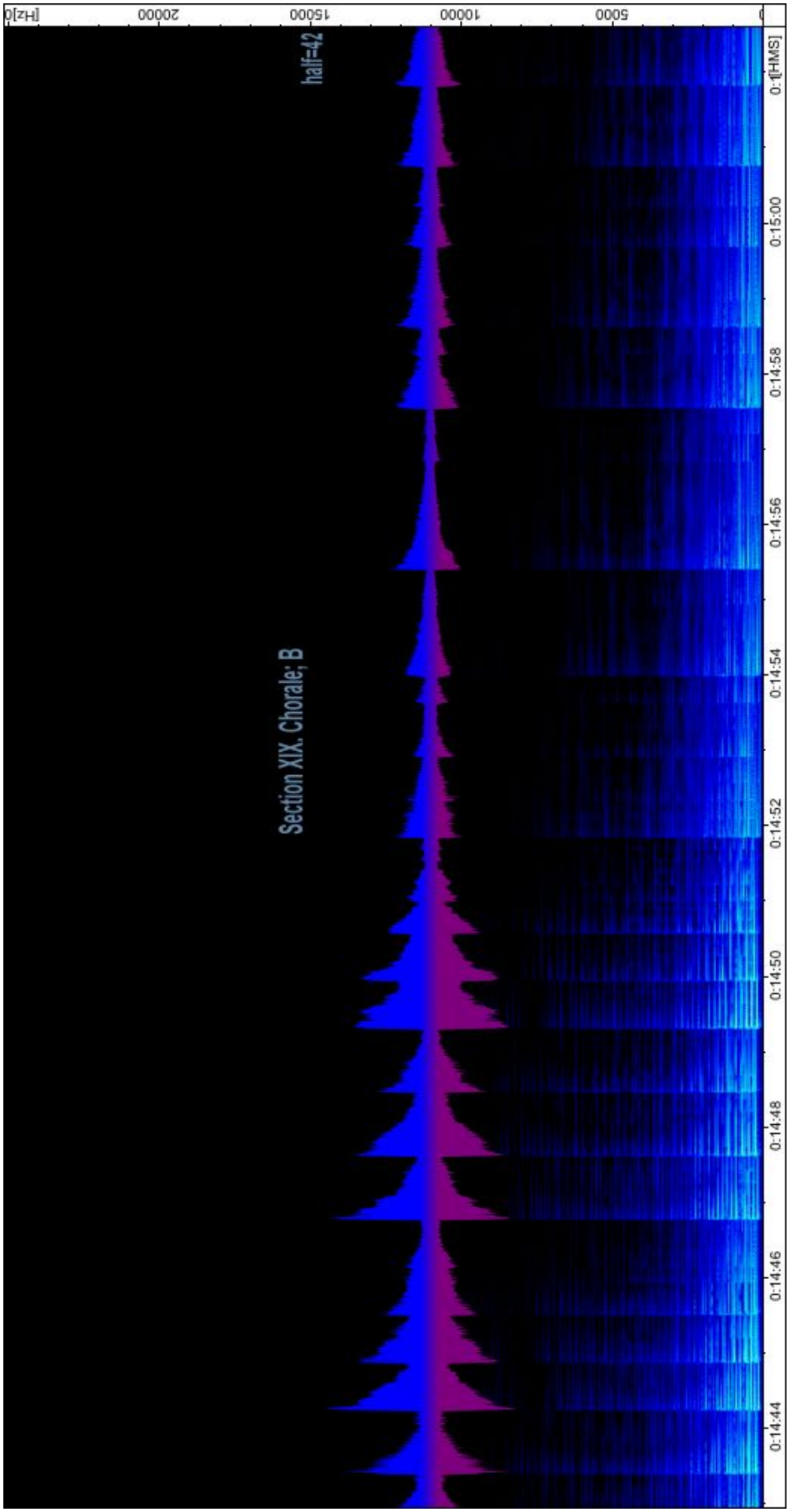
m. 404


Movement 5
Section XVII. Recapitulazione; A
[Hz]0
5000
10000
15000
20000
[HMS]
0:13:44
0:13:46
0:13:48
0:13:50
0:13:52
0:13:54
0:13:56
0:13:58
0:14:00
0:14:02

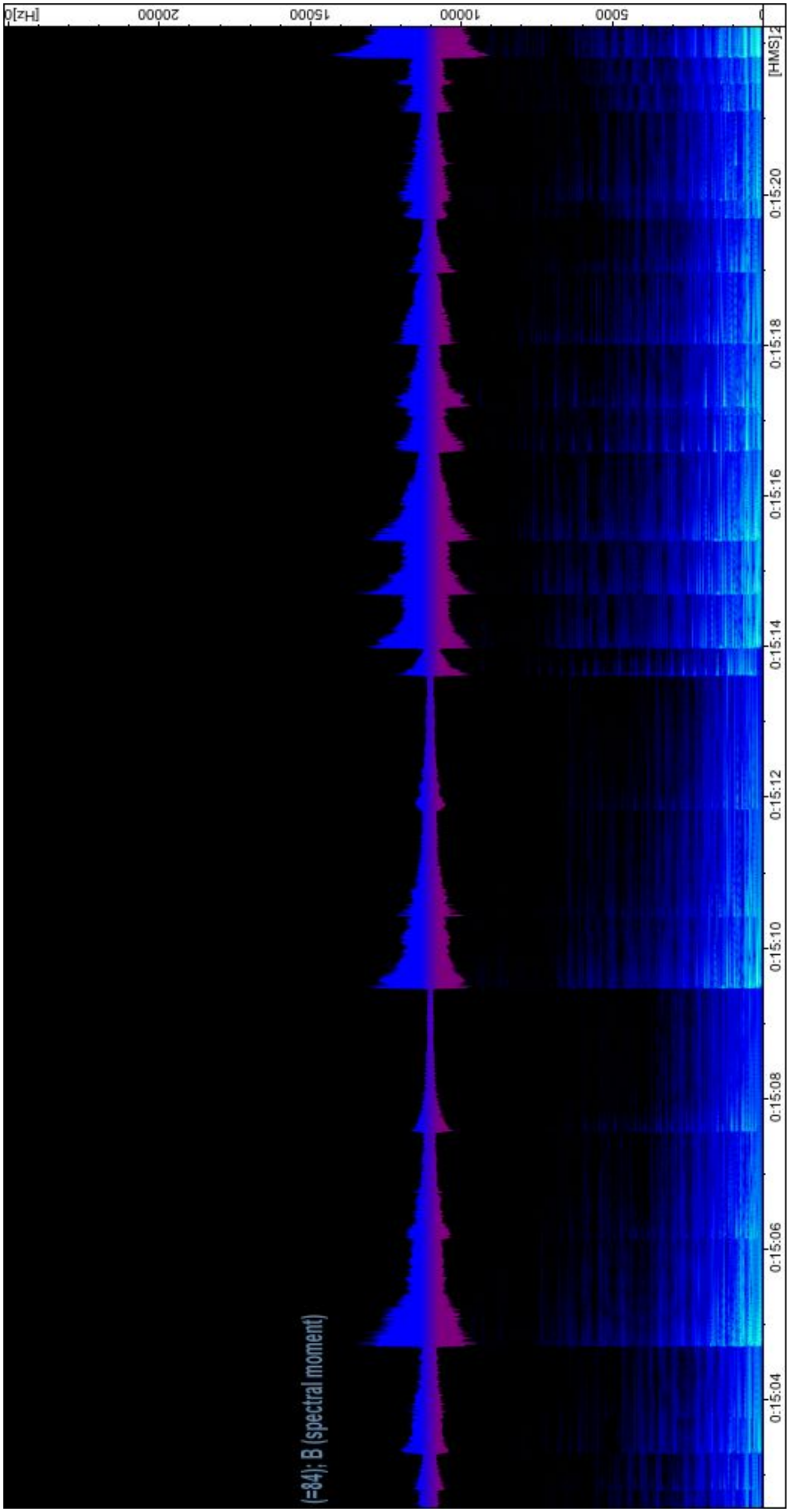

m. 415
m. 417
D
E
Section XVIII. Raga; A
[Hz]0
20000
15000
10000
5000
0
[HMS]
0:14:04
0:14:06
0:14:08
0:14:10
0:14:12
0:14:14
0:14:16
0:14:18
0:14:20
0:14:22


[Hz]0
5000
10000
15000
20000
0:14:42[HMS]
0:14:40
0:14:38
0:14:36
0:14:34
0:14:32
0:14:30
0:14:28
0:14:26
0:14:24

m. 419

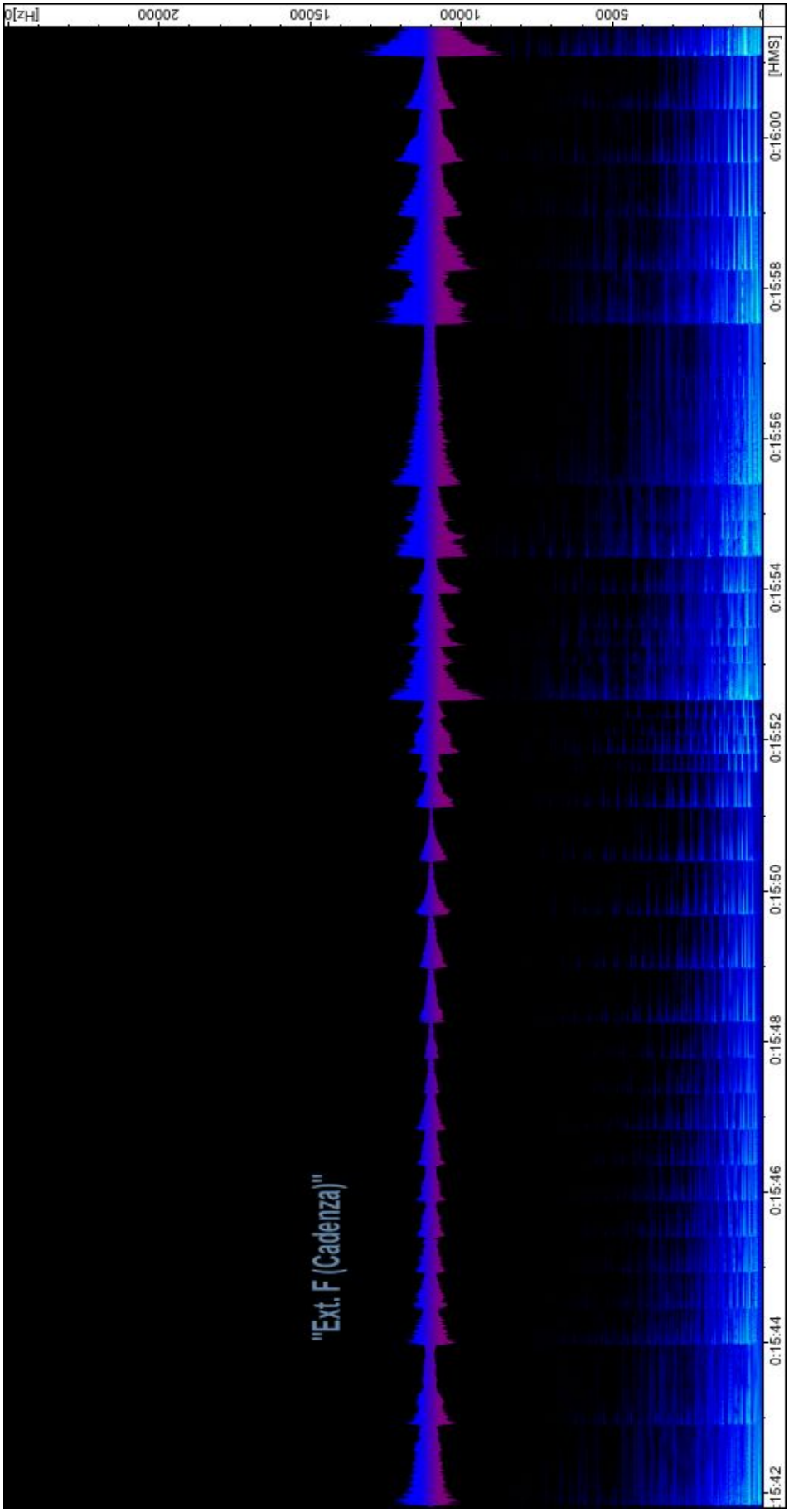

[Hz]0
20000
15000
10000
5000
0
half=42
Section XIX. Chorale; B
0:14:44
0:14:46
0:14:48
0:14:50
0:14:52
0:14:54
0:14:56
0:14:58
0:15:00
0:[HMS]

m. 435

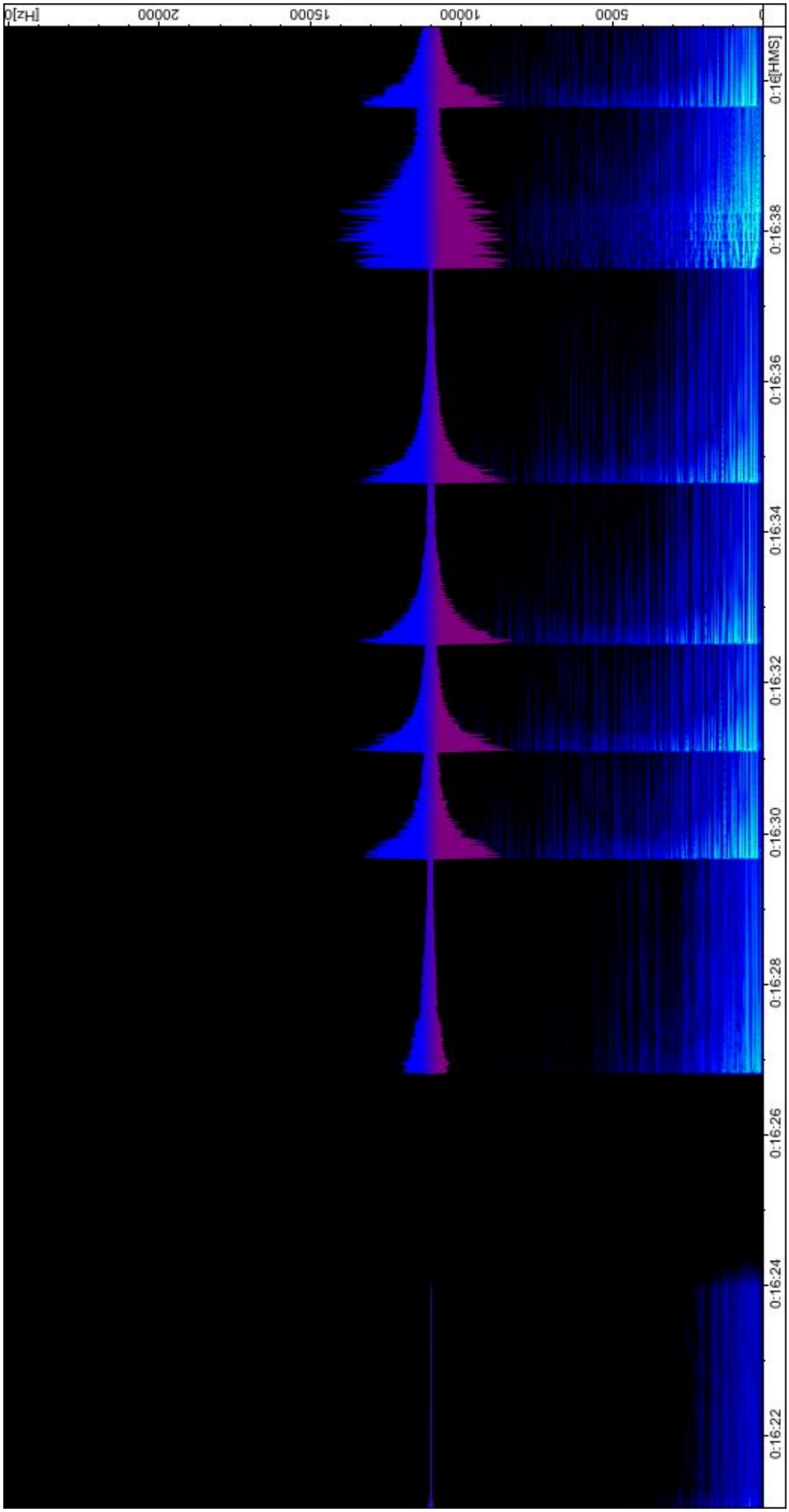

[Hz]0
5000
10000
15000
20000
[HMS]14
0:15:04
0:15:06
0:15:08
0:15:10
0:15:12
0:15:14
0:15:16
0:15:18
0:15:20
(=84): B (spectral moment)

[Hz]0
20000
15000
10000
5000
0
[HMS]
0:15:40
0:15:38
0:15:36
0:15:34
0:15:32
0:15:30
0:15:28
0:15:26
0:15:24

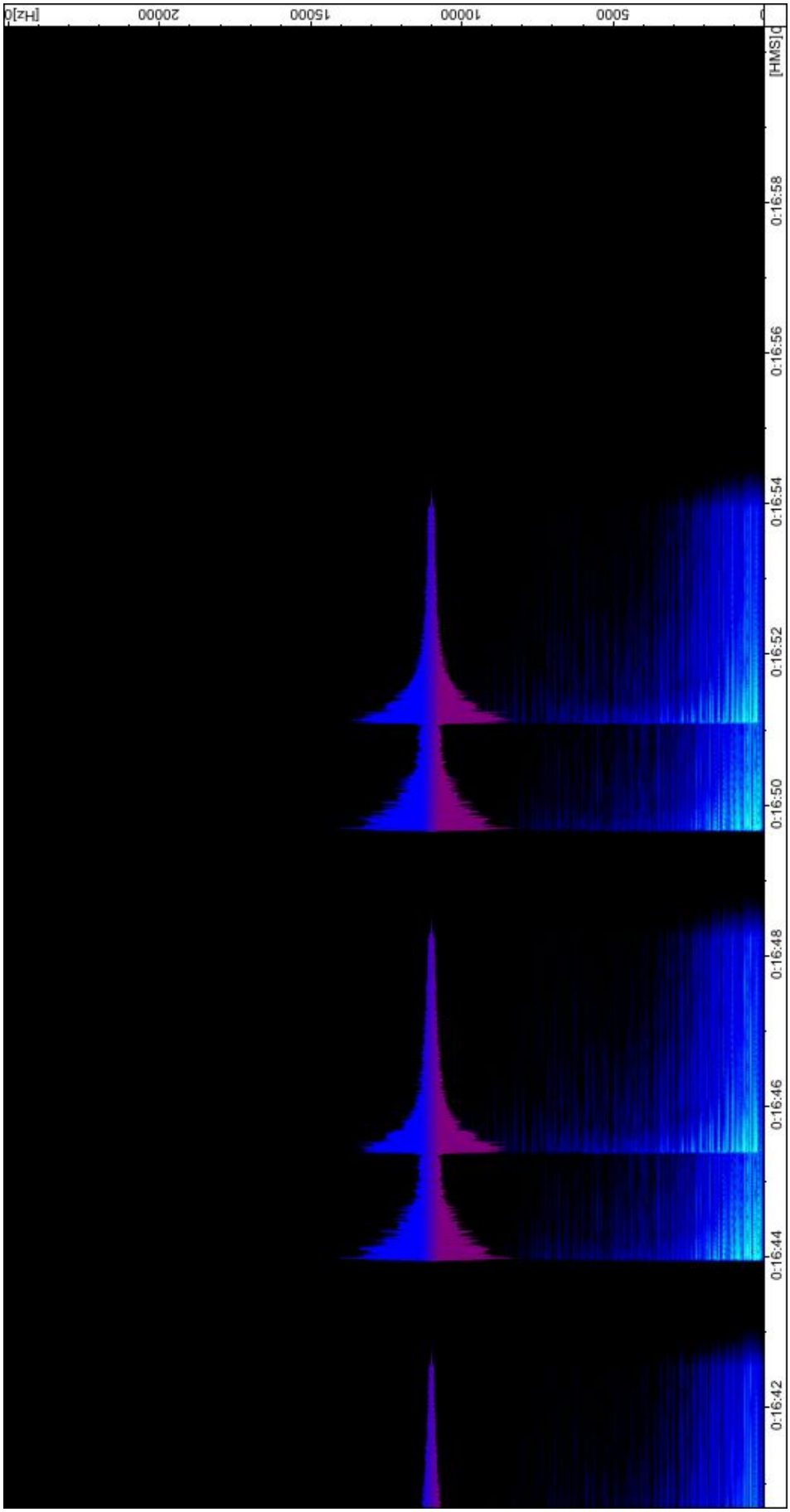
m. 440


"Ext. F (Cadenza)"
[Hz]
20000
15000
10000
5000
0
[HMS]
0:15:42
0:15:44
0:15:46
0:15:48
0:15:50
0:15:52
0:15:54
0:15:56
0:15:58
0:16:00

[Hz]0
20000
15000
10000
5000
0
0:16:20 [HMS]
0:16:18
0:16:16
0:16:14
0:16:12
0:16:10
0:16:08
0:16:06
0:16:04
0:16:02


[Hz]0
20000
15000
10000
5000
0
0:16[HMS]
0:16:38
0:16:36
0:16:34
0:16:32
0:16:30
0:16:28
0:16:26
0:16:24
0:16:22

END


[Hz]0
20000
15000
10000
5000
0
[HMS]0
0:16:58
0:16:56
0:16:54
0:16:52
0:16:50
0:16:48
0:16:46
0:16:44
0:16:42